

Sustainable Home Construction

We all have had concerns about our environment and the future of the environment for the generations to come. Because of this, more and more 'green' building elements are being incorporated into new homes and existing homes. Consumers and builders alike are wanting to build more environmentally sensitive homes and they are doing this by using materials that conserve energy and environmental resources. With this in mind, here are some key sustainable living elements that could be incorporated into any new or existing home of today.



SIPs (Structural Insulated Panels) – SIPs are building panels used in walls, roofs, and floors for residential and light commercial buildings. These panels are typically made by sandwiching a core of rigid expanded polystyrene foam insulation between two skins of oriented strand board (OSB). The result is a building system that is stronger than traditional stick framing, extremely energy efficient, and cost effective. SIPs also provide for a healthy and energy efficient home by greatly reducing outside air infiltration which maximizes the amount of inside air to be regulated by a filtered heat recovery system versus leaking through the shell of the home.

ICF's – Insulated Concrete Forms are forms for poured concrete walls that remain in place as a permanent part of the foundation and wall assembly. Approximately two and one-half inches of expanded polystyrene (EPS) foam comprise the inside and outside of the form, with plastic ties serving as connectors. Forms are assembled and put together in a similar fashion to stacking blocks in whatever shape the exterior walls have been designed. Walls are reinforced horizontally and vertically with steel rebar. The walls are also temporarily braced for added strength prior to the pour. Concrete is poured into the inner core of these forms. After the concrete has set, braces are removed, steel beams and support posts for floor systems are set, and floor joists and subfloor are installed.



Roof – There are quite a few options available when it comes to roofing your home. One you may want to consider is recycled rubber roofing. Utilizing roof tiles that are made from recycled rubber and recycled plastic, creates less granular runoff, compared to asphalt or slate roofing materials. This results in fewer pollutants flowing into stormwater. Because of the tiles improved strength, flexibility, and durability, they are able to overcome extreme weather conditions, are impact resistant, and maintenance free. In addition, most rubber roofing also offers high insulating properties, so in addition to being an eco-friendly product, it is an energy efficient choice too.

Pavement – Permeable Pavement – Permeable pavement can be used to lessen the amount of impervious surface on the lot. Impervious surface increases runoff amounts and provides opportunities for unhealthy particulates to enter the water supply. Permeable pavement, on the other hand, allows water to infiltrate the stormwater through the natural filtering mechanism of soil. This water seepage is then utilized to help recharge the aquifer.

“We all have a responsibility to be good stewards of the environment, working toward preserving our natural resources for present and future generations. For me, it begins with education. When I install the insulating concrete forms, people stop and want to know what is being built and why. This gives me the opportunity to talk to them about the energy efficiency and durability of ICF construction.”

– Josef Fischer with Thermal Concept Builders.

Geothermal – Geothermal heat pumps (GHPs) are a relatively new technology that can save homeowners money. These ground-source heat pumps use the natural heat storage capacity of the earth or ground water to provide energy efficient heating and cooling. These systems work on a simple premise: heat is taken from the ground and transferred through a heat pump to the air in your home. The heat in your home can also be transferred back into the ground, during the summer, to cool your home. The best part about Geothermal systems is the return on investment. According to the Geothermal Heat Pump Consortium, a geothermal system can lower your heating bills up to 50% and your cooling bills up to 30%. This means you have a return on your investment within 2 to 7 years. This is also a naturally renewable energy source, therefore making it friendly to the environment.



Solar Thermal Panels & Photovoltaics

– The technique called photovoltaics, is a solar power technology that uses solar cells or solar photovoltaic arrays to convert light from the sun directly into electricity. The arrays are mounted on the roof line (typically on the south side) of a home at varying angles, depending on the sun’s angle and the time of year. This orientation helps maximize the energy created through the use of the arrays. With solar thermal panels, water is primarily heated by a passive solar thermal hot water system that operates with two flat panels mounted on the roof. This system connects to a large solar thermal storage tank that is also a high-efficiency, natural gas back up (the Phoenix) that transfers heat to the incoming cold-water line just before entering the hot water tank. This system is a closed-loop drain back that utilizes a special water solution to protect from freezing. On a daily basis, you can expect to heat approximately 100 gallons of hot water through this system.



Recycling – There are a host of innovative recycled components available for use in residential homes. Many of them are made of recycled components or encourage the process of recycling. One of these processes is the rainwater catchment system. This system collects the rainwater off the roof of the home and stores it in an underground tank, which offers great environmental benefits. Another recycled product is concrete. “The Milwaukee metropolitan area has been at the forefront of using alternative substitutes for cement because of its access to a by-product from coal fired power plants. The by-product is called fly ash.” said Michael Coello of Coello and Associates, Inc. Fly ash, due to its molecular makeup, actually accentuates concrete’s overall strength. Other ‘green’ recycled products to look for in a homes design are flooring, countertops, doors and textiles.