

GREEN TECH THE SERIES COLUMN FOR JANUARY 7, 2015
HEADLINE: EARTH HOMES NOW MODULARIZED!

As with so many “green” initiatives, old becomes new. In this case, it true with a new twist where your home comes in a modular package that can be located almost anywhere. Enter the folks at “Green Magic Homes” and their modular packages that you screw together, cover with dirt and presto....you have an earth home.

First a bit of history here and we are talking about earth homes, not earth ships, which are fully self-sustaining homes. Earth sheltering has been around since man began constructing permanent homes and evolved from the nomadic life style. If you stretch it a bit, one could call cave dwellings earth shelters. The accepted technical definition goes something like this, “An earth building is one where the thermally effective element is placed solely on the roof, but is usually a continuation of the earth-bunding at the unexposed elevations of the building.”

There are three common methods of building an earth home. Firstly, there is in-hill construction, where the footprint is excavated into the side of a hill. The second method is where the home is actually underground or below grade as it’s called. The last and more common method is called earth berming. This is where the home is built and then the earth is piled up against the exterior walls, compacted and set to a grade that allows the soil to slope away from the home.

The benefits of an earth sheltered home are numerous. The thermal mass of the soil packed over the home offers protection from the elements; almost no maintenance; the exposed side or sides can be located to take advantage of passive solar, and the biggest one, thanks to the thermal mass, the ability to absorb and retain heat.

The largest single drawback to an earth home is the cost. They are expensive to build. As well, attention to detail so that you have a 100% waterproof structure before covering with dirt, has been an ongoing challenge for the sustainable home building community. Enter Green Magic Homes and their novel idea. Recently, I spoke to Gustavo Santander, the founder and Sales Manager of Green Magic Homes. They began developing this concept in Columbia, South America some five years ago and have slowly developed this patented design to the point where it is now marketable.

Based in Florida, with a fabrication plant in Cancun, Mexico, they produce a fiber reinforced composite home by means of joining various sections together on

a flat concrete base or a concrete footing to allow other methods of flooring. Gustavo commented that the shell components are fully customizable to accommodate any building design. They have seven home packages ranging from the “Martinica” model, which covers just over 690 sq. feet to the largest model called the “Mediterraneo,” which has a footprint of just over 1900 sq. ft. The components have perforated flaps that screw and seal together and are anchored to the foundation. Gustavo went on to say that the vault geometry and curves are utilized, collaborating with the structure to re-enforce the stability and integrity of the modular sections. As the majority of these homes will likely end up in areas of climatic extremes like hurricanes and tornadoes, the use of high strength fiber reinforced polymers is a welcome plus to the product.

As noted and a consideration with any product, cost is always a factor and I have heard of earth homes costing well over \$300.00 a sq. foot, finished. Green Magic Home kits are reasonably priced; quite reasonable actually, even when you look at our deflated dollar. The base model costs \$19,255.00, while the top of the line Mediterraneo comes in at \$66,596.00 USD. This translates into approximately \$35.00 to 42.00 per square foot. These kits include all of the strong, lightweight structural components, wood doors and windows as per the design, galvanized steel screws and elastomer for sealing the overlap joints. Complete packaging and assembly manuals are included. Plumbing, electrical, etc., will add to the price per sq. ft., of course.

I asked Gustavo how long it would take to assemble the shell and he said the smaller model would take three people about three days from start to finish, provided the base concrete pad or footings are already in place. They are shipped in containers, a 20 foot container for a home up to 860 sq. ft. and a 40 foot container for upwards of 1700 sq. ft. Once assembled, the design allows for up to eight inches of soil on the top and, of course, it would be graded away on the other elevations. Eight inches of soil is ample for most plants and especially vegetable gardens.

They expect the larger portion of their market to be in warmer zones like the US south and Midwest where the soil does not freeze and keeps its thermal value, specifically keeping the home cool. In the northern climates, however, it is well known that frozen soil has little or no insulation value. This would be where the use of close cell, 2lb spray foam would have to be factored into the overall cost of the Green Magic Home budget. Additionally a rubber membrane would have to be considered to help protect the spray foam applied to the outer shell. The modules are designed to handle about 44 pounds per square foot of live load on

top of the soil so the addition of spray foam should not be a factor. A professional spray foam contractor with considerable experience should be contacted.

The concept is amazing, a quick, affordable and unique earth home that could be located in almost any setting. Thanks to Gustavo for taking the time to explain his invention. If you are considering stepping just a bit outside the box for a home design, the Green Magic Home concept is worth a serious look. For more information go to their web site; an excellent site I might add.

www.greenmagichomes.com

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