

# greensphere

1

2

3

demolition / construction debris

recycled

landscape integration

foundation / concrete

insulated concrete forms (ICF)

flyash concrete

non-toxic termite control

framing / siding

sustainable lumber

structural wall panels

engineered trusses, joists, etc.

insulation

cellulose

agricultural fiber / recycled denim

soy-based spray foam

green roof

windows / doors

low E glass

heating / cooling

ultra high-efficiency heat pump

completely sealed ductwork

programmable thermostat

geothermal

solar

hot water			
tankless		○	○
solar		○	○
geothermal			○
super high efficiency tanks	○	○	○
energy production / conservation			
landscaping	○	○	○
solar			○
energy star appliances	○	○	○
water conservation / recovery			
roof recapture / delivery		○	○
gray-water recapture / delivery			○
xeriscape	○	○	○
pervious materials	○	○	○
efficient faucets, toilets, appliances	○	○	○
other features			
sustainable flooring / cabinets	○	○	○
low VOC content	○	○	○
recycled countertop material	○	○	○
CFL / LED lighting	○	○	○
natural paint		○	○
whole-house water / air filtration		○	○

**\*\*\*Please read below for further information and details on the many green options that are available for our Greensphere houses.**

**Demolition/Site Prep:**

- Recycle demolition and construction debris

All demolition and construction related debris that can be recycled is done so on and off site. This greatly reduces the amount of waste taken to the landfill and provides needed materials on site.

- Incorporate site landscape instead of 'defeating' it

Any and all native plant life that can be salvaged or relocated is done so. Our houses are designed to maximize the existing benefits of the existing plant life as well as the topography of the site.

## Foundation

- Pre-formed panels (ICF)

Insulated Concrete Forms or ICFs are a pre-fabricated concrete panel incased in insulation. These panels can be used for basement walls and/or entire exterior wall framing. While their use has many advantages, the main benefits, environmentally speaking, are the fact that they have the highest R-value available for an exterior wall (R-50 as opposed to a standard OSB sheathed wall which has a R value of R-4), they use less concrete than a poured foundation and basement wall, and they reduce the amount of material needed for framing.

- Flyash concrete

Flyash is a by product from coal-fired electric plants and can be used as a substitute for up to 35% of the Portland Cement needed in concrete. Portland Cement takes enormous amounts of energy to produce so by substituting it with flyash, less greenhouse gas is emitted in the concrete making process. In addition to the environmental benefits, flyash concrete is stronger, less water permeable, reduces corrosion of reinforcing steel, increases sulphate resistance, and reduces alkali-aggregate reaction.

- Fiber cement wall form

- Non-toxic termite control (Borate, sand barriers, etc.)

Traditional termite protection offers two options: poison the soil around your home or place poison in bait traps. Neither one is exactly friendly to the ground or anything that may live in it. Sand barriers are natural termite barriers that are gaining popularity as research pours in confirming their effectiveness. Wood framing, as well as barrier treatments, treated with boric acid are also excellent non-poisonous methods of control.

## Framing/Siding

- Sustainable lumber

Sustainable lumber means that the wood used in its production comes from a source that is well managed and continues to renew itself. This is extremely important as some lumber, especially imported, does NOT come from sustainable forestry practices and is often the result of clear cutting practices, which leave the forest completely dead and without hope of regeneration.

- Structural wall panels

- Trespa panels

Made from recycled softwood and resin, Trespa panels are incredibly strong and have a 100 year warranty.

- Engineered joists, trusses, etc.

Using engineered trusses and joists increases the overall strength of a structure while at the same time reducing the amount of wood needed.

- Fingerjoint wood

This wood is usually made from waste scraps of other wood that would otherwise have been landfilled. Fingerjoint is an incredibly straight wood as it is made by gluing small pieces of wood under pressure in a pre-molded form.

- Domestic hardwoods for trim/molding

Hardwoods are always a desired finishing material that people want in their homes. What most people do not realize is the majority of exotic and tropical hardwoods are imported from other countries that have little to no regulatory rules regarding tree harvesting. Almost all of these woods are old growth trees clear cut out of rainforests. Much of this wood ends up on the black market which in turn ends up in U.S. ports. One of the most popular imported tropical hardwoods in the United States is Mahogany, yet 95% of this wood is illegally cut down and imported via black market channels. Using domestic sustainable grown and harvested hardwoods such as cedar and maple can give a similar aesthetic appearance as tropical hardwoods, but without the incredibly damaging and compounding effects on the environment.

- Fiber cement boards

Also known as Hardi-board or Hardi-siding this alternative to wood or vinyl siding is superior due to its ease of installation, longevity, low-maintenance, and insulation properties.

- Wood composite trim

## Insulation

- Cellulose

This insulation is made from recycled paper. Pre-treated with boric acid, cellulose is a far superior to fiberglass as an insulation medium both in terms of its pest resistant properties and its insulation R-value which is higher than fiberglass. This insulation can be blown and batted.

- Agricultural fiber

Mainly made from recycled cotton denim, this type of insulation comes in batts and is pre-treated with borates to act as a flame retardant as well as a natural pest barrier.

- Cementitious foam

- Non-CFC spray foam

## Windows and Doors

- Molded hardboard

- Recycled content jambs

- Low E/Energy Star

Low-E glass is some of the most energy efficient glass for windows due to its insulation R-value.

## **Roofing**

- Recycled metal
- Green

Also known as living roofs, green roofs are roofs that have plant life as a surface as opposed to shingles or some other non-permeable inorganic material. Green roofs capture rainwater, reduce the heat island effect, do not need replacing, minimal to no maintenance, increase roof life span, reduce stormwater run off, filter pollutants and CO2 out of the air, filter pollutants and heavy metals out of rainwater, and best of all, insulate your home up to 60% better than a traditional roof.

- Solar

While solar panels are not a replacement for some type of roofing material, they do shade the majority of the surface on which they are affixed. They not only produce electricity, but act as a thermal shade for your home as well thereby reducing the need for more air conditioning.

## **Heating/Cooling**

- Passive solar design (Operable windows, Thermal mass, Thermal chimneys, Wing Walls)

All of our structures have some element of passive solar design. This means that either the design, orientation, and/or the materials of the structure positively contribute its overall energy efficiency.

- Earth sheltered

The structure is insulated by the Earth by having a large majority of the structure in or under the ground.

- Solar
- Well installed/sealed ductwork

Over 20% of a traditional structure's heating and cooling efficiency is lost to poorly sealed/installed ductwork. This seems like a simple thing to do, however, the majority of HVAC systems are not installed or sealed properly. Paying attention to this detail is something worth getting right.

- Ceiling Fans
- Programmable thermostat
- Geothermal

A geothermal exchange heat pump, also known as a ground source heat pump (GSHP), is a heat pump that uses the Earth as either a heat source, when operating in heating mode, or a heat sink, when operating in cooling mode. All geothermal heat pumps are characterized by an external (ground) loop and an internal (building) loop, each containing refrigerant. These loops can deliver heating and cooling directly to ground or building or, via heat exchangers, through secondary loops containing water (or a antifreeze mixture with water and propylene glycol, denatured alcohol or methanol). GSHPs work because of the consistent temperature underground below the frost line; therefore, very little energy is needed to either heat or cool because the ground temp is acting as a natural heat exchange eliminating the need to use energy to cool or heat up an element.

## **Hot Water**

- Solar

These hot water heaters are extremely energy efficient using little to no energy to heat and store the water. Usually paying back within 2 years, solar water heaters have the fastest return of their initial cost of any solar based system.

- Geothermal
- Tankless

Uses energy and heats water on demand which reduces the need expend energy to keep a tank of hot water hot.

- Super high efficiency tanks

High efficiency tanks are very similar to a traditional hot water tank only they are more insulated and energy efficient through the use of more modern technology than their predecessors.

## **Energy Production/Conservation**

- Solar (Concetrated, Photovoltaic)

We are all familiar with this technology by now as it has been around since the late 70's; however, its implementation and availability have increased greatly. One of the cleanest methods of energy production out there today and aside from its initial cost...free!

- Landscaping (Trees shade building/HVAC, Windbreak, Reflective Roof/Walls, Shaded pavement)

Strategically placed vegetation can make a huge difference in a buildings energy requirements. By shading areas of a structure, or its surrounding paved surfaces, shade provided by trees can provide a decrease of 20-25 degrees of temperature on a hot day.

- Energy efficient appliances
- Wind

While still somewhat impractical for small applications, wind power is the cleanest power generation solution out there. No toxic chemicals for its parts and no energy required to run.

## **Water Conservation/Recovery**

- Roof runoff recapture/delivery

Instead of letting the water from the roof of a structure simply drain out into open space and/or a city's over burdened storm water system, a rainwater capture system can either provide passive or on demand irrigation. This not only saves on the water bill, but puts perfectly good water to use while conserving drinking water derived from municipal sources.

- Gray-water recapture/delivery

Functions in much the same way as a rain capture system only this water is taken from the drains of a structure's bathroom sinks and showers. This method offers a much more dependable source of irrigation.

- Xeriscape

This is a term used to describe a type of landscaping in which the plants being used require little or no proprietary watering thereby saving water and money.

- Pervious materials

These materials are alternatives to impervious concrete. Typical driveway concrete does not allow water to be absorbed by the ground beneath causing this water to be wasted. Examples of these materials are slate chips, permeable concrete, paver stones, eco-pavers, etc.

- Water efficient faucets, toilets, and appliances

## **Lighting**

- Passive parabolic solar

A relatively new technology that uses a parabolic dish (like a satellite) that tracks the sun throughout the day and passively channels the light through fiber optics connected to 'fixtures' throughout the house. The light produced by a single fiber optic in this system is equivalent to a 50 watt incandescent bulb and is entirely passively generated.

- LED/CFL

CFLs or compact fluorescent light should be the only type of light being installed in any home or business...green or otherwise. To say that incandescent light bulbs are inefficient from an energy standpoint would be an understatement. The technology used in today's incandescent bulbs is over 100 years old and converts only 5 percent of the energy it consumes to actual light. The other 95% is expelled as heat. CFLs are much more efficient and LED (light emitting diodes) are even more efficient lasting longer than the lifespan of the structures in which they are being installed.

- Passive (Sidelighting/Skylighting)

One of the oldest and still best ways of naturally lighting a space for free and without the use of energy.

- Clerestory
- Interior colors
- Reflected light
- Timers

## **Flooring**

- FSC certified wood/laminates/veneers
- Concrete
- Recycled (Carpet, Carpet padding, Linoleum, Tile)
- Low VOC content

## **Cabinets**

- Low VOC

## **Tile/Countertop Materials**

- Recycled

## **Paints, Finishes, and Adhesives**

- Low VOCs

Volatile organic compounds (VOCs) are organic chemical compounds that have high enough vapour pressures under normal conditions to significantly vaporize and enter the atmosphere. VOCs are a concern due to their carcinogen nature, particularly indoors where their levels are often times much more concentrated. There are many low VOC or natural alternatives in the products that commonly contain high levels of VOCs and we use these alternatives whenever possible.

- Natural