

GREEN DESIGN FOR EARTH'S SAKE

By Carol Lamkins, CMKBD, CID



Green design, aka "sustainable design" or "eco-design", is a reaction to the global "environmental crisis". The earth is experiencing rapid growth of economic activity and human population, depletion of natural resources, damage to ecosystems and loss of biodiversity. Proponents of green design believe that the crisis is in large part caused by conventional design and industrial practices. We have become a consumable and disposable society.

Green design is considered a means of reducing or eliminating these practices and substituting less harmful products and processes for conventional ones. Support and motivation for green design came to popular attention in E. F. Schumacher's 1973 book Small is Beautiful¹. Sarah Susanka, the author of the Not So Big House² series, promotes the concept that bigger is not better when it comes to housing size and that trading off those dollars for higher quality construction and finish materials will produce more satisfying results. The bottom line is that larger houses require more land and furnishings as well as incur higher operating and maintenance costs.

Current issues go beyond the size of our homes. They include building materials and harmful product outgassing issues.

At the top of the list was the discovery that **lead** and **asbestos** are toxic. Paint containing lead was used in homes built as recently as the 1970s. Houses built between 1930 and 1950 commonly contain asbestos insulation. Asbestos can still be found in textured paint, patching compounds and vinyl composite tiles installed before 1977. Now it is known that inhaled asbestos fibers cause lung cancer.

Volatile Organic Compounds (VOCs) are carbon-based chemical compounds that contribute to health issues. Today, society is only beginning to realize the harmful effects of VOCs found in common products such as paints, wood preservatives, aerosol sprays, cleansers, disinfectants, moth repellents, air fresheners and dry-cleaned clothing. These compounds are solvents that make paint, urethane, rubber and glue into a temporary liquid for application. Then the VOCs evaporate into the air at room temperature thus entering the lungs as we breathe. VOCs can cause eye, nose and throat irritation, headaches, loss of coordination, nausea and damage to liver, kidney and the central nervous system. According to the U.S. Environmental Protection Agency (EPA)³, VOCs can cause cancer in animals and some are suspected or known to cause cancer in humans. VOCs also react with sunlight and the atmosphere to create smog.

Formaldehyde is a low-emitting VOC carcinogen commonly used in adhesives for particle board, plywood, MDF, foam insulations and the treatment of textiles. Formaldehyde is a health hazard at high exposure levels. The Occupational Safety and Health Administration (OSHA)³ regulate formaldehyde and have adopted permissible exposure levels that do not create a health hazard. Look for third party tests to verify manufacturer claims that formaldehyde levels are safe. The "greenest" labels are EPA-regulated claims of "zero-VOC" or "low-VOC".

Molds have a nasty way of getting into everything, including building sealants. There was a 300% increase in mold-related litigation from 1999 and 2004⁴. Exposure to mold can produce

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adverse health effects through inflammation, allergy or infection. As mold grows, metabolic gases are emitted which contain VOCs and can cause indoor air quality problems. Insufficient ventilation retains moisture in the interior of a building giving rise to mold growth. Certified mold inspections include a comprehensive analysis of each mold tested property, complete with lab mold test results and a written report with the best recommendations for mold prevention and mold removal.

To create safe and healthy environments, interior designers must first be aware of the chemical contents of various materials and the risks and benefits associated with these chemicals. Acute health and comfort effects experienced in Sick Building Syndrome (SBS)⁵ may very well be a result of these chemicals.

In general, the Renewable Energy Policy Project (REPP)⁶ in connection with the American Council for an Energy Efficient Economy (ACEEE)⁷ have studied environmental responsible design and concluded that, in addition to lowered energy costs related to efficient construction practices, owners and residents of "green" homes also enjoy:

- Increased occupant comfort
- Improved indoor air quality
- Reduced noise infiltration
- Decreased fading of fabrics and other materials from sunlight

And in commercial settings, the benefits are:

- Greater worker and customer comfort
- Increased productivity
- Decreased absenteeism
- Lower maintenance costs

Their report estimated the value of health and productivity savings in current eco-effectively designed structures to be at \$30-\$170 billion dollars per year.

The solutions to these environmental issues are not easy. It will require reduced use of non-renewable resources to minimize environmental impact. Fortunately this is a burgeoning trend within the fields of architecture and interior design. In the forefront are the four R's of sustainably designed and built buildings – rethink, reduce, reuse, and recycle.

Rethink materials by choosing low-impact, non-toxic, sustainably-produced or recycled materials which require little energy to process.

- Sustainably harvested woods for flooring such as bamboo or plantation grown Lyptus
- Longer lasting and better functioning products that are replaced less frequently, reducing the impacts of producing replacements such as ceramic versus plastic discs in faucets and 16-18 gauge stainless in sinks
- Low VOC paints, caulks and sealants and formaldehyde-free cabinets and shelving materials using pressboard or MDF

Reduce energy and water consumption.

- Select Energy Star⁸ rated lighting fixtures and appliances
- Cross compare the costs of operation/energy consumption on the Energy Guides posted on appliances such as dishwashers, refrigerators, clothes washers, dryers and water heaters

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- Install water saving faucets such as a sensor activated faucets and low flow showerheads (federal mandate is 2.5 gallons of water flow per minute but there are effective units with output of only 1.5 gallons per minute)
- Select low flow or sensor activated plumbing fixtures especially those that sport the WaterSense⁹ certification logo such as dual flush or high efficiency toilets
- Opt for low water usage in appliances such as clothes washers (front loading clothes washers are more 40% more water efficient and up to 75% more energy efficient compared to top loading models) and dishwashers (top rack only or double drawer)

In respect to maintenance requirements and material replacements, it is important to consider longevity by selecting the most durable products.

Specify for reuse and recycling those products, processes, and systems designed for performance in a commercial 'afterlife'. Standard, modular parts allow products to be repaired rather than replaced. Upgradable systems simply require new components rather than complete replacement.

Reuse of materials whenever possible reduces project costs by avoiding the expense of disposing of them as well as reducing the need to purchase new materials.

Recycle materials whose production can be sustained without harming people or the environment.

- Reclaimed wood floors
- Recycled glass terrazzo countertops
- Recycled doors, windows, cabinets, and more

There are multiple motivations for designing and building green. Whether it is the overall monetary savings, the sense of wellbeing by living in a healthy home or the idea of reducing the impact on the global environment, "green" is the way of the future. It begins with the commitment from each individual. Margaret Mead put it so succinctly:

**"Never believe that a few caring people can't change the world.
For, indeed, that's all who ever have."**

References:

1. E. F. Schumacher, Small is Beautiful, 1973
2. Sarah Susanka, **Not So Big House**, 1998, 2008
3. www.epa.gov/iaq/voc.html
4. Maryrose McGowan, Specifying Interiors, 2006
5. www.epa.gov/iaq/pubs/sbs.html#Introduction
6. www.repp.org
7. www.aceee.org
8. www/EnergyStar.gov
9. www.epa.gov/watersense

Recommended viewing:

DVD – "An Inconvenient Truth" with Al Gore