

Defining Green, Sustainable, Intelligent and Secure Buildings

Compiled by The Burnham-Moores Center for Real Estate at the University of San Diego.

With all the talk of green these days, it's easy to feel like we will soon all be mandated to maintain compost piles in our backyards and hug a tree daily or become outcasts. It's like America suddenly woke up to the fact that our resources are finite and our demands infinite. Chalk this up to some good leadership by the USGBC (U.S. Green Building Council) as well as inspirational books and talks by experts like Bill McDonough of "Cradle to Cradle" fame. This link includes some definitions to help novices sort out the various political forces and perspectives coming to bear on this tsunami of new environmental and efficiency concerns.

CABA: Continental Automated Buildings Association, based in Ottawa, Canada. CABA is a not-for-profit industry association that promotes advanced technologies for the automation of homes and buildings in North America. CABA encourages the development, promotion, pursuit and understanding of integrated systems and automation in homes and buildings.

Green: A term applied to practically everything in which energy savings and resources are conserved or re-used. More specifically, it is related to the LEED rating provided by the U.S. Green Building Council (USGBC) or the "Energy Star" rating provided by the U.S. Environmental Protection Agency (EPA).

Energy Star: In 1992, the U.S. Environmental Protection Agency (EPA) introduced Energy Star as a voluntary labeling program designed to identify and promote energy-efficient products to reduce greenhouse gas emissions. A few years ago, the EPA extended the label to cover new homes and commercial and industrial buildings. Those rated as among the most 25 percent energy efficient are given the Energy Star rating. Over time, this rating should become more difficult to achieve since it is a relative score as opposed to an absolute score like the LEED ratings.

LEED: LEED is a product of the U.S. Green Building Council. It stands for Leadership in Energy and Environmental Design and applies to the design, building materials used and operation of the building. Points are awarded for sustainability, water efficiency, energy and atmosphere, materials and resources, indoor environmental quality and design innovation. It is intended as a hurdle that only 25 percent of existing buildings will pass at the certified level with little additional cost. Higher point scores can result in Silver, Gold and Platinum ratings. Over time, LEED point systems will be revised. Categories that can achieve ratings include new construction, existing buildings, commercial interiors, core and shell, homes or even neighborhood developments.

Sustainable: A system that on a “net” basis does not deplete resources. With respect to sustainable development, the focus includes all those elements common to green buildings, as well as sites that are sustainable with indigenous landscaping, capturing “gray” water that has been used and rainwater, and designed to minimize transport costs. Mixed-use developments where people can work, live, go to school and play are a natural extension of sustainable development. Two good examples are Stapleton, Colo. (See <http://www.stapletondenver.com/>) and Birkdale Village, in north Charlotte, N.C. (See <http://www.birkdalevillage.net/welcome.htm>)

Intelligent: The term for an adaptable building that is likely green and also easy to retrofit or remodel for changing internal configurations and uses (also known as a **High Performance Building**). Such buildings have longer economic lives and cost much less to occupy. Typical elements of an intelligent building are modular floor units, removable walls, under floor venting and wiring for phones and data, motion sensor cameras and much more all on whips that are easy to re-configure. Back-up systems may include several sources of power and generators with battery back-ups and safe air/water storage systems. An example of an intelligent building would be ABN AMRO in Chicago (See <http://www.hines.com/property/detail.aspx?id=156> or <http://www.buildings.com/articles/detail.aspx?contentID=2128>. See also <http://www.intelligentbuildingstoday.com/> and <http://www.caba.org/index.html>.)

Secure Buildings: After Sept. 11, 2001, a number of new security measures came to be in many buildings. Some of these features include access control for visitors and maintenance staff. Other features include surveillance, back-up power, air, water and emergency plans. Secure buildings have several redundant systems. Secure buildings may be intelligent, but are not always green.

USGBC: The U.S. Green Building Council (USGBC) is a non-profit composed of leaders from every sector of the building industry working to promote buildings that are environmentally responsible, profitable and healthy places to live and work. More than 11,000 member organizations and 75 regional chapters are united to advance the mission of transforming the building industry to sustainability. (See <http://www.usgbc.org/>)

Glossary of Green Building Terms from San Diego EarthWorks

Alternative building blocks can be stacked to produce an energy efficient home. Some examples are: Perform Wall, a cement block system with recycled polystyrene; Faswall, a recycled wood-fiber cement block; and Hebel, an aerated cement block that is lightweight.

Duct sealing refers to stopping air leaks at joints, seams and other holes, especially in return ducts and plenums. The best method is to use water-based latex mastic that meets UL std.181.

Engineered wood refers to recycled/reconstituted wood products that are laminated or “finger-jointed.” The product is typically more uniform and has superior strength. Laminated Veneer Lumber (LVL) beams are glued together from defect-free veneers to achieve longer and thicker dimensions with superior strength than is available from solid woods, with less warping and twisting. Oriented Strand Board (OSB) is a layered, mat-formed panel product made of strands, flakes or wafers sliced from small diameter, round wood logs and bonded under heat and pressure. OSB’s strength comes mainly from the uninterrupted wood fiber, interweaving of the long strands or wafers, and degree of orientation of strands in the surface layers. TJI® joists, a high-tech combination of LVL flanges made from Douglas fir or southern pine and a proprietary web material called Performance Plus®, are manufactured to resist swelling and shrinking, and feature an efficient shape that enables them to carry large loads over long spans.

Fenestration is skylights, roof windows, vertical windows (fixed or moveable), opaque doors, glazed doors, glass block and combinations of opaque/glazed doors.

Graywater is wastewater produced from baths, washers and bathroom sinks. The wastewater generated by toilets, kitchen sinks, and dishwashers is called “blackwater.” Graywater can be used for irrigation purposes in some areas, although each county has different regulations.

Harvested rainwater is water captured from the roofs of buildings and stored in above or below ground cisterns for future use. Rainwater can be used for potable needs, irrigation, or both.

Insulating concrete forms (ICFs) are lightweight blocks, commonly made of expanded polystyrene or extruded polystyrene that are filled with concrete and remain in place to provide thermal insulation for concrete walls.

Insulation R-value is a measurement ranging from 1 to 60 that refers to the insulation’s ability to resist heat flow, affected by the insulation’s coverage, density, airflow near and through the insulation and water presence within the insulation.

Low-E windows have a low-emittance coating. The glass has microscopically thin, virtually invisible, metal or metallic oxide layers to reduce the U-factor by repressing radiant heat flow.

Low- and No-VOC paints and finishes do not contain volatile organic compounds (VOCs) that outgas and lower the quality of the indoor air.

Optimum value engineering (OVE) refers to framing techniques that reduce the amount of lumber or other materials to build a home while maintaining the structural integrity of

the building. OVE often results in lower material and labor costs and improved energy performance.

Passive solar design is an approach that provides heating and cooling without the use of mechanical equipment. The orientation of the building, site selection, materials and design features allow the home to collect, store and distribute the sun's heat in winter, block the sun during the summer, and provide for air circulation and natural daylighting.

Photovoltaics (PV) are solar cells that absorb sunlight and convert it directly into electricity. Solar cells are very thin rectangular wafers, typically made of silicon. A four-inch silicon cell can produce about one watt of DC electricity. A number of cells form a module or a module array. The more modules, the more electricity you can produce. For homes connected to their utility grid, excess power flows back into the power lines for use elsewhere.

Radiant barrier is a layer of metallic foil placed on the back of roof decking or attached to the beams just below the roof to reduce heat flow from the roof into the attic, thereby keeping the house cooler. To be effective, a radiant barrier must have its reflective surface face an air space.

Radiant floor heating is a heating system typically consisting of liquid-filled tubes placed in the flooring that can be heated; radiant heat can be zoned to provide heat only in the rooms that need it.

Ridge-and-soffit venting system is a continuous, weather-shielded opening at the peak of the roof in combination with continuous screened openings under the eaves of the house. It allows cooler air from under the eaves to enter the attic while allowing hot attic air to escape out the ridge vent at the top, thereby keeping the attic cooler and dryer without the use of electric fans.

Solar Heat Gain Coefficient (SHGC) is the fraction of incident solar radiation admitted through a window. SHGC is expressed as a number between 0 and 1. The lower a window's SHGC, the less solar heat it transmits.

Solar water heating occurs through collection tubes inside an insulated box, typically mounted on the roof. The tubes absorb the sun's heat and transfer that heat to water or another liquid flowing through the tubes to heat the water used in the home.

Straw bale construction utilizes straw bales that are compressed, baled and tied together to form the walls of a home. The straw bales may be load bearing or infill, where a frame is incorporated to carry the structural load. Straw is a renewable material that provides excellent insulation.

Steel framing uses metal studs and rafters. Steel is recyclable, dimensionally stable, will not burn and is termite-proof. Steel is an excellent conductor of heat and should normally be used only in building systems that include a continuous insulated covering.

Structural insulating panels (SIPs) consist of two exterior structural panels adhered to a rigid foam insulation core that replaces traditional framing. SIPs typically range in thickness from 4 inches to 12 inches and can be a package system with pre-cut windows and doors.

Xeriscaping is landscaping that conserves water and protects the environment. It utilizes native plant selection, practical turf areas, efficient irrigation, and mulches and appropriate maintenance.

"Glossary of Green Building Terms." San Diego EarthWorks. Nov. 13, 2007
<http://www.earthdayweb.org/SDEW_GBT_Articles/SDEW_GreenBuilt_Glossary.html
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