

GREEN BUILDING AND PRODUCTIVITY

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Abstract

Green building (also known as green construction or sustainable building) refers to a structure and using process that is environmentally responsible and resource-efficient throughout a building's life-cycle: from sitting to design, construction, operation, maintenance, renovation, and demolition. This requires close cooperation of the design team, the architects, the engineers, and the client at all project stages. The Green Building practice expands and complements the classical building design concerns of economy, utility, durability, and comfort. Although new technologies are constantly being developed to complement current practices in creating greener structures, the common objective is that green buildings are designed to reduce the overall impact of the built environment on human health and the natural environment by:

- Efficiently using energy, water, and other resources
- Protecting occupant health and improving employee productivity
- Reducing waste, pollution and environmental degradation.

KEYWORDS:Need and Goals of Green Buildings, Green buildings and Productivity, Sustainable energy Performance Of Green Buildings etc.

Goals of green building

The concept of sustainable development can be traced to the energy (especially fossil oil) crisis and the environment pollution concern in the 1970s. The green building movement in the U.S. originated from the need and desire for more energy efficient and environmentally friendly construction practices. There are a number of motives for building green, including environmental, economic, and social benefits. However, modern sustainability initiatives call for an integrated and synergistic design to both new construction and in the retrofitting of existing structures. Also known as sustainable design, this approach integrates the building life-cycle with

each green practice employed with a design-purpose to create a synergy among the practices used.

Need for Green buildings

According to the U.S. Environmental Protection Agency, Sick Building Syndrome is caused by four major categories as listed below:

Inadequate ventilation: In the early and mid-1900's, building ventilation standards called for approximately 15 cubic feet per minute (cfm) of outside air for each building occupant, primarily to dilute and remove body odors. As a result of the 1973 oil embargo, however, national energy conservation measures called for a reduction in the amount of outdoor air provided for ventilation to 5 cfm per occupant. In many cases these reduced outdoor air ventilation rates were found to be inadequate to maintain the health and comfort of building occupants. Inadequate ventilation, which may also occur if heating, ventilating, and air conditioning (HVAC) systems do not effectively distribute air to people in the building, is thought to be an important factor in SBS. In an effort to achieve acceptable IAQ while minimizing energy consumption, the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) revised its ventilation standard to provide a minimum of 15 cfm of outdoor air per person (20 cfm/person in office spaces).

Chemical contaminants from indoor sources:

Most indoor air pollution comes from sources inside the building. For example, adhesives, carpeting, upholstery, manufactured wood products, copy machines, pesticides, and cleaning agents may emit volatile organic compounds (VOCs), including formaldehyde. Environmental tobacco smoke contributes high levels of VOCs, other toxic compounds, and respirable particulate matter. Research shows that some VOCs can cause chronic and acute health effects at high concentrations, and some are known carcinogens. Low to moderate levels of multiple VOCs may also produce acute reactions. Combustion products such as carbon monoxide, nitrogen dioxide, as well as respirable particles, can come from unvented kerosene and gas space heaters, woodstoves, fireplaces, and gas stoves.

Biological contaminants: Bacteria, molds, pollen, and viruses are types of biological Contaminants. These contaminants may breed in stagnant water that has accumulated in ducts, Humidifiers and drain pans, or where water has collected on ceiling tiles, carpeting, or insulation. Research discussed above suggests that new buildings may often result in sickness-inducing

Environments as pollutants are generated from carpets, paint, concrete and constructed without regard to chemical compound release.

Literature Review

GREEN BUILDINGS AND PRODUCTIVITY

Norm G. Miller, Quiana D. Gough, Susan M. Davis

Healthier space need not be new space. In fact, some new buildings are extremely unhealthy as chemicals leach out into the air from glues, carpets, concrete and paint. There is no reason this must be the case. The cost to provide healthier environments is modest compared to the benefits. Healthier buildings reduce sick time and increase productivity, making it easier to recruit and retain employees. The results provided here are based on a survey of over 500 tenants who have moved into either LEED or Energy Star labeled buildings managed by CBRE. It is part of a much larger study that includes details on operating expenses, leasing and management available from the authors.

According to the results from the 2008 White Collar Productivity Index (WPI), the only study of its kind providing long-term data on how people actually spend their time at work, there was a reduction in the time people are spending on low productivity tasks during 2007 as compared to both 2006 and 2005. According to Bary Sherman, CEO of PEP Productivity Solutions, 'The WPI study indicate[s] that America's white collar worker are becoming smarter and more effective in their day-to-day routines. They appear to have a better grasp on how to use technology as a productivity tool and are getting more of the right work done in less time. Until this year we have seen a steady increase in non-productive time usage every year since we started measuring office productivity in 1994. It will be exciting to see how this trend plays out over the next years.

The entire WPI, expressed in hours per week, per person, is as follows:

ISSUE	YEAR 2006	YEAR 2007	% CHANGE
Handling Email	9.4 hours	7.3 hours	-22%
Handling Paper Mail	1.2 hours	1.0 hours	-17%
Attending Ineffective Meetings	3.0 hours	2.2 hours	-27%
Working Overtime	5.8 hours	4.4 hours	-24%
Delegating Work	4.3 hours	3.0 hours	-30%
Being Interrupted	4.6 hours	3.8 hours	-17%
Looking for	1.6 hours	1.3 hours	-19%
Working on Backlog	3.0 hours	2.2 hours	-27%
Planning Work	2.0 hours	2.1 hours	+5%

‘GREEN’ BUILDINGS: WHAT AUSTRALIAN BUILDING USERS ARE SAYING

Adrian Leaman, Leena Thomas, and Monica Vandenberg

A comparative post-occupancy evaluation, based on occupant surveys of 22 ‘green design intent’ buildings and 23 conventional buildings in Australia has been undertaken by Leaman, Thomas and Vandenberg. The study shows that while the best green buildings consistently outperformed the best conventional buildings from the occupants’ perspective, the first generation of Australian green buildings may be underperforming on some indoor environment variables. Green buildings that are designed and operated properly and are user responsive achieve positive environmental outcomes and simultaneously deliver positive feedback for comfort and productivity. On the other hand, green buildings that do not perform well, as a consequence of poor realization of design intent and little attention to user needs, run the risk of greater user dissatisfaction than many conventional buildings.

Sustainable Energy Performance Indicators of Green Building in Developing Countries

Mahsa QAEMI and Gholamreza HERAVI

The concern of environment and sustainable development has been increased recently. These problems force the countries to adopt a number of policies that enhance energy efficiency and apply baseline parameters in accordance with international standards. Green building has now become a forefront of sustainable development in this century that takes the responsibility for balancing long-term economic, environmental and social health. It offers an opportunity to create environmentally efficient buildings by using an integrated approach of design.

An Overview of the Green Building Concept

Indunil D. Batuwangala

Over the last three to four decades, in many fields in which human beings are actively involved in, the concept of ‘Cure’ has begun to be transformed into the concept of ‘Prevention’. In parallel, within the construction industry, the Green Building Concept evolved and came into existence in its one form or another and it has now been gaining its momentum rapidly across the world. The mankind has impacted so much on the global environment to twist its balance. Therefore, today, as the dependents of the environment, at whichever level in the society you and me are, it is a timely obligation of us to wide open our eyes towards changing our attitudes and the way of living. Begin individual, think simple and light but apply heavily, when need one, use

only one not two, impart the accrued benefits/losses with the person next to you and contribute towards a sustainable environment.

CONCLUSION

Analysis has lessons that can be learnt from occupants experiences and feedback in 22 Australian buildings specifically built with ESD objectives, compared with 23 conventional buildings surveyed using the Building Use Studies methodology and 154 buildings containing over 2,000 tenants that were deemed Green.

Review shows that in the green buildings studied:

- A wider spectrum of performance is evident, with the best green buildings outperforming conventional buildings, especially for thermal comfort and forgiveness. But the situation is not uniform and the green buildings studied are not better in all categories.
- Thermal comfort conditions in summer are generally poor, although there are some notable exceptions.
- Winter conditions can often be too cold.
- Ratings for design, image, health and needs are usually better.
- Perceived productivity scores are marginally lower on average, but a number of successful green buildings surpass conventional ones.
- Occupants seem to be more tolerant.
- Ratings for lighting are good.
- Internal noise is often worse.

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➤ **Wikipedia**