



## **"Smart" green design: Planning today for a more efficient tomorrow**

September 29, 2008 - Spotlights

The demand for green and sustainable buildings is growing rapidly, as research, government, educational, municipalities, and private owners are now exploring energy efficiency. Owners are discovering that a healthy, resource-efficient high performance building more than pays for itself in dramatically reduced energy costs and better health and productivity for its staff.

Green building involves energy and resource saving strategies such as low-E windows, reflective roofing, solar technologies, efficient and renewable energy systems. These new structures also use healthy, recycled materials like certified lumber, low-VOC finishes, and natural fibers, along with practices such as green roofs and daylighting.

"Smart" Green Design provides a holistic approach to the development of both new and renovated structures. It builds the project around a collaborative design team including owner, architect, engineers, construction manager and financing. This team sets the project goals and establishes the benchmarks for the proposed project...establishing the complexity of construction.

Smart green design is built around the following benchmarks:

- \* Substantially reduce environmental impacts
- \* Enhance and protect natural habitats
- \* Reduce operating costs
- \* Conserve resources
- \* Encourage renewable energy technologies
- \* Enhance building asset values and profits
- \* Increase worker productivity
- \* Improve indoor air quality

The LEED Green Building Rating System, Leadership in Energy and Environmental Design is a voluntary, consensus-based national standard for developing these high performance sustainable buildings, which was developed and administered by the United States Green Building Council. LEED provides a complete framework for accessing building performance and meeting sustainability goals.

A green roof initiative aims to lower temperatures, reduce urban heat islands, retain water to reduce stormwater runoff, and reduce water pollution. These vegetated roofs are lightweight, engineered systems that support the growth of low growing, drought tolerant succulents to wildflower meadows and vegetable gardens. The roof temperature will be reduced by about thirty degrees during summer. In addition to these benefits it also provides some good acoustic benefits in urban environments.

Another less costly way of reducing cooling loads on research and office buildings is to change the roof color from black to white and use of Energy Star roofing. This reflective coating will reduce

peak energy costs and the initial sizing of mechanical equipment.

Daylighting forms one of the cornerstones of sustainable, high performance design, affecting individuals on both conscious and subconscious levels. Proper integration with the electric lighting system can provide tremendous energy savings. Natural daylighting has always been of benefit for the office and research facilities. Daylighting can be provided with the use of windows, skylights and clerestories. This initiative has increased grade scores in our schools by as much as 26% according to a California Study completed in 1999.

Connecting the use of high performance glass with fixed overhangs, the research and office facility will be able to provide a healthier work environment, less absenteeism, and better worker attraction and retention.

Few investments generate greater returns than those designed to boost employee productivity. A modest investment in soft features, such as access to pleasant views, increased daylight, fresh air and personal environment controls, can quickly translate into significant bottom-line savings for an employer.

There are six basic daylighting principals:

- \* Prevent direct sunlight penetration into the space
- \* Provide gentle, uniform light throughout the space
- \* Avoid creating sources of glare
- \* Provide control for daylight with louvers and blinds
- \* Design the electric system to complement the daylighting design
- \* Plan the layout of interior spaces to take advantage of daylight conditions

Energy integration has some very positive effects on both sustainable design and the rising operational costs of facilities. The cost of running our facilities is increasing rapidly with the rise of gas, oil and electric rates. Cogeneration facilities, geothermal heating and cooling systems and ice storage are initiatives being redesigned to reduce these costs and keep them in some kind of control. Ice storage is seen as a way to reduce electric costs by using off peak hour rate structures and shaving peak demand.

Ice is created during the night hours, when electric rates are lower, and stored in containers. During the day, when electric rates are higher, the ice is melted to meet the cooling loads of the facility, instead of running chillers.

Cogeneration is the on-site generation of electric power from heat or steam, and is particularly attractive in industrial settings where processes generate heat or steam as a by-product.

Geothermal heating and cooling can be achieved in a variety of ways. Most often, ground water is used as a heat source in winter and a heat sink in summer for the operation of water-sourced heat pumps. These systems can be supplemented with boilers and cooling towers to provide additional capacity or balance seasonal heating and cooling loads.

There are many ways to reduce your operational costs. Savings can be made through:

- \* Peak shaving
- \* Renewable energy sources
- \* Federal and State energy tax credits
- \* Energy efficient equipment programs
- \* Energy alternatives
- \* Installation, maintenance and commissioning of building mechanical and electrical equipment

The use of recycled materials has a tremendous impact on our environment. Increasing the

demand for building products that have incorporated recycled content reduces the amount of natural resources needed to be extracted from our environment.

Our buildings have a profound impact on our natural environment, health, and productivity. Green Design is creating a worldwide plan of action stating that environment and development concerns must be integrated to ensure improved living standards, protected eco-systems, reduce energy costs and provide a better architecture for us to live, work and play in. A green design focus would consider future costs, employee well being, and our planet.

Robert Blakeman, A.I.A., is a principal in the architectural group at Paulus, Sokolowski & Sartor (PS&S), Warren, N.J.

New York Real Estate Journal - 17 Accord Park Drive #207, Norwell MA 02061 - (781) 878-4540