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Better Designs

Taking 'LEED' in green building makes for healthier bottom line

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Soaring commercial and residential expansion in San Antonio provides an opportunity for us to reach for a standard of development that takes the environment, the economy and the well being of our citizens into account. Green building, the cornerstone of sustainable development, employs best practices for optimizing efficiency in energy, water and materials; minimizing waste and pollution; and creating better indoor environments.

Build San Antonio Green, the region's first residential green building program, certifies homes that meet minimum standards in energy, water, materials, site development and health. For commercial structures, the Metropolitan Partnership for Energy and Greater San Antonio Builders Association, administrators of Build San Antonio Green, advocate the Leadership in Energy and Environmental Design (LEED) Green Building Rating System® established by the U.S. Green Building Council.

LEED is a voluntary, consensus-based national standard for developing high-performance, sustainable commercial buildings. A substantial component involves health, or concern for the indoor environment. Designing buildings to improve indoor air quality can produce benefits for workplaces and employee productivity, as well as building owners. A certified green or healthy structure can be a strong incentive when promoting the sale or lease of residential or commercial space.

'Healthful' standards

The Environmental Protection Agency (EPA) lists poor indoor air quality as the fourth-largest environmental threat to our country. Sick Building Syndrome (SBS) is now a recognized cause of fatigue and illness. According to the EPA and the National Safety Council's Environmental Health Center, SBS is caused by poorly designed ventilation and the presence of biological contaminants such as bacteria, molds and pollens. Indoor air pollutants can come from tobacco smoke, building materials, decorating products, cleaning practices, pest control, furnishings, dust and activities such as heating and cleaning.

With SBS, building occupants complain of symptoms such as headaches; eye, nose, and throat irritation; a dry cough; dry or itchy skin; dizziness and nausea; difficulty in concentrating; fatigue; and sensitivity to odors. Most of the complainants feel relief soon after leaving the building. SBS reduces worker productivity and may also increase absenteeism.

Green building insures proper ventilation, a reduction of particulate matter and alternatives to chemical contaminants as long as maintenance and remodeling activities work in concert with the intent of the established green materials and systems when the building was constructed. Correctly designed and properly ventilated buildings do not allow mold and other biological contaminants to grow and thrive. Undesirable particulate matter, which can aggravate respiratory problems, is minimized through clean, filtered and well-maintained air flow systems.

Design and materials

The design elements of a structure play an important role in eliminating indoor pollutants. Attempts should be made to incorporate permanent entryway features, such as grills or grates, to capture dirt and particulate matter at all entryways with heavy traffic. The building also should include occupant controls for airflow, temperature and lighting. Possible options include task lighting, operable windows and under-floor heating, ventilation and air conditioning (HVAC) systems with individual diffusers.

The building's design should maximize the amount of controlled daylight that can reach interior occupied areas. Controlled daylighting involves reflective surfaces and diffusing elements that enable daylight penetration while controlling glare. In addition, lighting sensors should be installed to augment the amount of daylighting to provide needed illumination levels for the tasks required.

Building materials, furnishings, and certain products such as air fresheners, cleaning agents, and pesticides, can release pollutants more or less continuously. Formaldehyde-free materials are recommended for flooring, sub-flooring, built-in cabinetry, insulation and finishes for walls and ceilings, and furnishings. All adhesives and paints ideally should have no or very low Volatile Organic Compound (VOC) content. Natural and water-based coatings are preferred. Low and no-emission floors and flooring finishes are also important, and natural floor coverings are favored over conventional carpeting.

During construction, all air conditioning duct openings should be sealed and fiberglass duct material should be avoided. Installation of materials should be sequenced to avoid any contamination of absorptive materials such as insulation, carpeting, ceiling tile and gypsum wallboard. If all of the above cannot be done, contaminant levels in the building should be tested and the building thoroughly flushed with fresh air for a week before occupation.

Ventilation

LEED guidelines suggest that new or existing buildings should have a carbon dioxide monitoring system that provides data about space ventilation performance in a quantifiable way so that measurable adjustments can be made. Ideally, the HVAC system will have carbon dioxide monitoring sensors integrated into the building automation system. In addition, the HVAC and building envelope should be designed to optimize air change effectiveness (providing fresh air without wasting energy).

Air change effectiveness can be improved through a variety of ventilation strategies, including: displacement ventilation, low-velocity ventilation and plug-flow ventilation, such as under-floor or near-floor delivery; and operable windows. These are improvements over the conventional air supply and return registers. Air change effectiveness should be tested after construction is completed.

Creating an environment that is conducive to comfort and productivity is beneficial for both the tenants and owners of commercial buildings. A green structure offers superior air quality, an enhanced work environment and stronger appeal for tenants and buyers.

Green at Home

The importance of having a healthy workplace is of no greater importance than having a healthy home environment. Many of the considerations listed above translate well to homes and apartments. Individual control of thermal comfort is easier in the home than it is in the office. Special awareness of toxic sources in the home, from gas heating to treating the lawn to the best ways to isolate living areas from the garage, is highly recommended.

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