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GRAY AREAS FOR GREEN CONSTRUCTION

Green construction can save money and help save the environment. What's not to like? For property risk control professionals, there are actually several points of contention, starting with the potential for green construction to conflict with fire protection protocols.

Green certainly is in: 75% of CEOs would build green facilities despite the 2008 credit market crisis, according to a 2008 Turner Construction study. The same study reports that 83% of surveyed executives would seek LEED certification if constructing a green building in the next three years.

According to the U.S. Green Building Council (USGBC), as of March 2009, there were 2,384 LEED-certified projects, up from 404 LEED-certified projects in 2005. Furthermore, there are now 18,468 LEED-registered projects located across all 50 states and 91 countries. Finally, USGBC membership quadrupled between 2000 and 2009 and now comprises 18,805 member organizations.

GREEN SAVES THE GREEN

The idea of environmentally friendly construction is clearly gaining momentum. Executives in the Turner Survey see great potential for cost savings:

- 84% said green buildings have lower energy consumption costs
- 68% said green buildings have lower operating costs
- 59% said total green building costs are less than traditional building costs over a 10-year period

Construction is a complex undertaking, however, and often new technologies bring unintended consequences. Below we examine the potential impact of the rapidly expanding green building movement on property loss prevention, looking at compatible philosophies, potential synergies and possible conflicts.

COMPATIBLE PHILOSOPHIES

Green building philosophy focuses on performance sustainability with reduced environmental impact and operating costs. The six green building principles are:

1. Sustainable site (selection and planning)
2. Water efficiency (management)
3. Energy and atmosphere
4. Material (use) and resources
5. Indoor environmental quality
6. Building system design and innovation

Property risk control focuses on three primary goals related to clients' business interests:

1. Preservation of capital investment and market share through mitigation of anticipated operational risks/exposures
2. Operational performance longevity through encouragement of robust maintenance programs
3. Promotion of mitigation techniques for natural or man-made catastrophic exposures

POTENTIAL SYNERGIES AND CONFLICTS

SITE SELECTION CONSEQUENCES

Green site selection usually supports traditional property risk control by providing a seat at the table for a risk control advocate during the actual design process. The design and construction phases are the most cost-efficient and convenient times for designing and installing physical property risk protection systems.

Green site selection principles support the traditional property risk control concept of hazard evaluation during the due diligence process. Traditional property risk control focuses on the evaluation of earthquake, flood, hail, snow, wind and other natural catastrophe exposures during site selection or actual construction.

Focus on storm water management and heat island reduction in green site selection promotes the use of vegetated roofing systems. These roofing systems may not be suitable for certain operations. Here, green design can be in conflict with property risk control.

WATER EFFICIENCY CONSIDERATIONS

The green water efficiency principle may conflict with the traditional property risk control concept of water-based fire protection. Using recycled or grey water supplies for traditional fire sprinkler systems presents exposure to supply vacuums, sediment accumulation and microbiologically influenced corrosion (MIC).
Perhaps most importantly, the focus on water preservation challenges the frequent testing of fire protection system components. Since the systems operate only during emergencies, frequent testing is the only mechanism for verifying the systems will work.

The drive for water efficiency may spur the growth of fire protection technology that features low water emission, such as water mist systems and waterless approaches, such as clean agent systems. Today, these systems are used for unique hazards or environments. They are not as effective as water-based sprinkler protection. Perhaps the green building movement will provide the spark for new technology that is both highly effective and water efficient.

ENERGY REDUCTION AND ATMOSPHERIC IMPACT

Green principles focused on the reduction of energy consumption and atmospheric pollution can impact traditional property risk control in a variety of ways. Energy management systems in efficient buildings can create low temperature environments where fire sprinkler systems can actually freeze. The use of thermal barriers or other components designed to restrain environmental temperature should have fire resistance ratings that conform to building code requirements. NFPA and FM Global recommend a 40°F environmental temperature to avoid freezing in fire sprinkler systems.

Building envelope integrity is crucial to reduced energy consumption and withstanding wind-related or extreme temperature events. The green focus on frequent commissioning promotes robust maintenance and improvement programs. These programs can vastly improve the performance of aging buildings during natural catastrophes.

RECYCLED MATERIAL RAMIFICATIONS

The green principle of recycling and reusing material can create storage burdens that can nullify or overload existing fire sprinkler protection. Special storage areas should be designated during the design process to allow for adequate fire sprinkler protection.

The green focus on using reconstituted products may reduce fire resistance. Locally recycled products are often produced in small quantities with inconsistent material properties – attributes that can create havoc for the assessment of fire resistance.

COST OF BETTER INDOOR AIR

Green indoor environment quality principles support property risk control concepts related to human element management programs. Alignment occurs in smoking policies (including enforcement standards) in all occupancies and dust mitigation in manufacturing or research occupancies.

This green principle does conflict with the property risk control concept of fire containment and extinguishment via sprinklers in the following two ways:

1. Increased exhaust/ventilation air flow can delay sprinkler response or cause sprinklers to activate sporadically during fires. Sprinklers are designed to contain or extinguish fires by activating in successive rings as the fire expands. Sporadic sprinkler activation can quickly overload the available water supply due to water pressure and volume design requirements.

2. Large open spaces such as atriums, often a feature of green design, pose a challenge to fire protection via sprinklers. Sprinklers struggle to contain or extinguish fires more than 45 feet below the sprinkler level. A water droplet simply cannot penetrate a fire and heat plume or vale from this distance.

Green design promotes the use of under-floor and ceiling air distribution systems for cooling effects. Current property risk control concepts focus on early detection of incipient stage fires within cable clusters above or below occupied environments, posing a potential conflict.

BUILDING CONSTRUCTION AND DESIGN INNOVATION

The green principle of building innovation through integrated design teams and operations supports traditional property risk control concepts. In theory, integrated design teams will address potential hazards with mitigation techniques suggested by property risk control advocates. This would save the owner the costs of retrofit construction and can reduce the cost of risk transfer options, e.g., insurance.

SUMMARY

Green construction and property conservation share core philosophies, but risk professionals should be aware of potential property risk exposure created from evolving green construction trends. The examples we raise are just that – examples. They represent complex situations, which will vary with every building and every green upgrade. Please consult your local property risk control advocates for project-specific concerns.

Other Willis publications on related green topics include:
Willis North America Real Estate and Hospitality *Views*, May 2008
Willis North America Construction Practice *I-Beam*, October 2008

CONTACTS

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