

RISK Bulletin

Green Building Construction Risks

The green movement has come in waves over the years, but it appears this time all are on board and it is here to stay. The US Green Building Council (USGBC) has released data indicating that buildings are responsible for 36% of energy use, 65% of electricity consumption and 30% of the greenhouse gas released annually in the United States. The construction industry and building owners have responded to these facts and started designing and constructing more sustainable buildings. McGraw-Hill Construction, a leading provider of construction related information and research, projects that by 2013 the green building market will represent 25% of all new construction costs, equating to a \$140 billion market.



The USGBC, established in 1993 as a non-profit trade organization that promotes sustainability in how buildings are designed, built and operated, is best known for the development of the

Leadership in Energy and Environmental Design (LEED) rating system for certifying that buildings are designed and constructed in accordance with green principles. Although LEED is the best known, there are currently several certifying entities and programs available supporting the construction industry. No matter the certifying vehicle that is being used, potential changes are ahead and the bar is about to be raised.

Sustainability and green construction are on their way to becoming not just the right thing to do, but the only way it can be done. In March 2010, the International Code Council (ICC), the American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE), the US Green Building Council (USGBC), and the Illuminating Engineering Society of North America (IES) announced the launch of the International Green Construction Code (IGCC), a set of adoptable and enforceable green building codes.

For decades, the ICC and ASHRAE have worked to develop codes and guidelines that have become the standard of care for the design, construction, operations and maintenance of buildings in the US and internationally. Their recent combined effort with the USGBC is reported to be the most significant development in the building industry in the past ten years. The combination of ICC's delivery infrastructure, which reaches to all 50 states and more than 22,000 local jurisdictions, and the ASHRAE, USGBC and IES's technical strengths should accelerate the implementation of green building codes and

standards across the country and possibly globally. This new code was designed to establish a regulatory framework for the construction of high performance commercial buildings that are safe, sustainable and by the book.

The IGCC provides minimum requirements for the energy-efficient design of buildings. In addition, the IGCC has incorporated ANSI/ASHRAE/USGBC/IES Standard 189.1, Standard for the Design of High Performance, Green Buildings Except Low-Rise Residential Buildings, which provides an alternate path of compliance. It forms a strong technical backbone for the IGCC document and allows for a jurisdictional compliance option.

ASHRAE's goal for the 2010 standard is a 30% increase in energy savings over its 2004 standard. The standard addresses site sustainability, water use efficiency, energy efficiency, indoor environmental quality (IEQ), and the building's impact on the atmosphere, materials and resources. These five key subject areas, as well as plans for construction and high-performance operation, are each addressed in separate sections. Both standards were written in mandatory language to allow for adaptation with building codes.

As the construction industry continues to work to provide value to its clients through value engineering, guaranteed maximum pricing with cost savings back to the owner, and design/build for one-stop shopping, green construction has become the current "hot" value-added service. However, with the implementation of this new standard, green construction will no longer be value-added; it will be "THE" standard of care for commercial building construction.

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To date, initial construction costs for green buildings have been reported to range from 2% to 5% over traditional construction. Since profit margins are tight, owners may not be willing to pay these additional costs, possibly putting contractors in the position to manage and construct to a higher standard of care with little additional fees. Therefore, it will be the knowledgeable risk savvy contractors that fair well in this new environment.

CHANGING RISKS

Building green is truly the right thing to do. There are many aspects to a "green" building, but the cornerstone of a sustainable building is the reduction of energy and water usage. However, establishing a baseline for comparison of improved efficiencies has presented a challenge.

A November 2007 report by the New Buildings Institute of Vancouver, Washington, commissioned by the USGBC to conduct a study of the energy usage of LEED-rated buildings, reported a 25% energy savings in LEED buildings. However, concerns with the data quickly emerged, as only 121 of the 522 LEED-certified buildings at the time voluntarily provided energy information; the comparison to existing buildings included buildings constructed as early as 1920; and the average energy use per square-foot was compared to median values, thus not allowing an apples-to-apples comparison. Therefore, risks of green construction not only revolve around building to green standards, but also include challenges with measuring building performance.

NEW AND CHANGING STANDARDS

To ease the concerns associated with evaluating the energy efficiency of certified LEED buildings, beginning in 2010, LEED certified building owners will be asked to submit energy and water bills for the first five years of operations as a condition of certification. Theoretically, the USGBC could use this data to revoke certifications if the building does not meet efficiency requirements upon evaluation. However, this controversial approach is only in the “what if” stage and is by no means finalized.

In addition to the concerns and potential impacts to the construction industry from the IGCC, the 189.1 standard includes a requirement that building projects provide for allocated space for the future installation of on-site renewable energy systems. The risks and liabilities associated with the requirement to design for future system installations is a topic in and of itself, but this emphasizes the need for the construction industry to carefully review this new standard to ensure a greater understanding of what may be expected.

MOLD

The construction industry has made great strides in managing the exposures of mold growth associated with building systems and construction methods, but concerns are arising that the installation of some green systems may be causing an increase in mold growth, particularly in regionally demanding climates and/or in buildings with complex structures. Increasing the amount of outside air brought in for ventilation to meet green building air quality criteria can also result in the intake of higher humidity air and the potential for increased mold growth. Ventilation systems must be equipped to manage the potential increases in relative humidity.

Likewise, utilizing additional insulation to improve energy conservation in buildings may also increase the potential for mold as the insulation can hide water leaks and prolong drying times. An obvious example is the use of vegetative roof systems, which may improve energy and water conservation, but

also require additional waterproofing controls to prevent water intrusion and mold growth. Good construction practices need to continue to stress managing water and moisture intrusion, not abandon accepted controls for green certification.

PRODUCT/SYSTEM INTERACTIONS

It is imperative that green products and systems be evaluated prior to recommending, designing and installing. Equally important is their interaction. Many times when design specifications are evaluated, they are evaluated individually, but the interaction of products and/or systems may result in a synergistic failure; especially if one or more are newer, unproven technologies. Examples can include a building envelope and the HVAC systems, or a vegetative roof (and their potential for greater water intrusion issues) and the insulation system. If a building envelope consultant is hired to oversee the design and installation of the envelope, it is imperative that they understand and assess the interactions between the various building systems as well.

NEW TECHNOLOGY

In order to truly evaluate systems, one must understand the technology and the variety of systems available in the marketplace. Research



and development has resulted in improved energy efficiency; however, the quick pace of these advances has resulted in few tried and true reliable systems. Instead, “new” efficient systems are being installed with minimal field data. As a result, designers and contractors are faced with installing systems that are “designed” to be efficient, but may not be appropriate due to the complex nature of the building or its geographical region. Also impacting this situation is that contractors have limited experience with these newer systems. So when a system doesn’t perform as intended, it becomes a question of whether it is a manufacturer issue, a design issue, or a contractor installation issue. Thus, costly litigation may ensue to proportion liability. When contractors utilize systems that they have solid experience with, performance issues are greatly reduced.

RISK MANAGEMENT

Firms need to approach green construction as they would any new aspect of their business, through a thorough risk evaluation and management process. It is anticipated that there will be an up-swing in litigation as the number of LEED-certified and LEED-registered projects continues its upward trend. Additionally, many law firms are beginning to establish a green litigation division. It remains to be seen whether litigation will revolve more heavily around:

- LEED-intended buildings not achieving certification or anticipated certification levels thus missing out on tax benefits;
- Systems not achieving the proposed efficiency levels; or
- Systems that require more than anticipated cost for maintenance and operation.

No matter what emerges as the root-cause of green building litigation, the key risk management technique is defining and allocating risk appropriately. Uncertainty about who is responsible for what, compounded with contractors and designers having minimal experience with new products and systems, and with a potentially higher standard of care, may result in extremely complicated litigation.

INTERNAL RISK MANAGEMENT

In order to effectively manage the exposures associated with green construction, firms must first identify and evaluate the risks that they face. Contractors may have exposures when:

- Installing unfamiliar systems,
- Assuming responsibility for achieving efficiencies,
- Managing the effects of the interaction of installed green systems, and/or
- Assuming the responsibility of documentation for certification.

Contractors need to be knowledgeable in both the process of certification and the product technologies used in green construction. By proactively educating personnel in these potential exposure areas, the contractor can minimize risks before the project even starts. By understanding the uses and the limitations of newer “green” technologies, personnel can implement controls, through means and methods or via conversations with the architect and/or owner, even if their direct interaction with the systems have been limited.



Another step to further manage internal risks can include engaging a third-party. This third-party can be an oversight entity used to assist with system installation, system interaction, system testing or solely for documentation responsibilities. The use of such an entity, with appropriate insurance coverages, may be a proactive risk management solution that helps off-set some of the liabilities accepted by a firm.

After the risks have been identified, evaluated and managed, either through avoidance or implemented controls, the final and perhaps most important component of risk management is to evaluate the effectiveness of these controls. Without evaluating protocols during a project, problems may not surface until the project is over and a claim is under way. Addressing problems early is more cost effective and can minimize devastating impacts to a project's profitability.

CONTRACTUAL RISK MANAGEMENT

Internal risk management procedures are put in place to ensure a successful project; however, liability for an unsuccessful project is determined by the contractual liability accepted. The contract should be used to allocate risks to parties that have the most appropriate ability to control a given risk. There are no internal risk management techniques that can be instituted to manage assumed contractual liabilities that are beyond a firm's control. Is it within a contractor's control to deliver a LEED Gold building, when the USGBC is responsible for certification? Is it in their control to install a certain system or use a specified building material when the architect specifies them? It is generally accepted that standard industry contracts cannot adequately address the exposures and risks faced by contractors performing green construction projects. Therefore, green construction project contracts

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While the American Institute of Architects (AIA) has incorporated “green” requirements as part of their code of ethics and have included requirements to discuss the feasibility of incorporating environmentally responsible design approaches with their clients, the Association of General Contractors (AGC) has released ConsensusDOCS 310 Green Building Addendum as the construction industry's only current standard contract document addressing the unique risks and responsibilities associated with building green.

AGC's standard Addendum was designed to take into consideration the elevated risks in green building design and construction. It includes:

- Design strategies potentially impacting the risks
- Unique materials and systems associated with these projects
- Re-evaluation of traditional design elements consistent with implementation of the green building measures
- Apportionment of liability
- Changes to the design and/or construction to accommodate green building objectives; and
- Post-completion actions and obligation

No matter if a firm uses this standard document, or incorporates their own language into either their standard contract agreement or one of the other

industry standard documents, language should be developed by legal counsel familiar with the construction industry, green building risks, and risks associated with the geographical location of the work.

CONCLUSION

Contractors need to actively identify and manage their risks and exposures on green building projects. Although risk management protocols will vary depending on a firm's organizational structure and philosophies, suggestions for managing "green" risks include:

- Keep current on new and changing standards
- Research green building systems and products to gain knowledge of their advantages and limitations
- Have personnel take educational courses
- Partner with firms that have experience in performing green construction
- Speak with colleagues at professional organization meetings to discuss their experiences and challenges with green projects
- Review industry standard contract documents and develop an approach
- Review and adapt current mold programs
- Determine approach to using a third party to provide green oversight or documentation

These steps provide an opportunity to identify, evaluate and institute risk management techniques before a project even starts. Proactive risk management will make the challenges of a green project more manageable and allow a firm to make a profitable move into the green arena.

REFERENCES AND RESOURCES

Websites

ASHRAE – www.ashrae.org/pressroom/detail/17123
 ConsensusDOCS – <http://consensusdocs.org/catalog/300-series/consensusdocs-310-green-building-addendum/>

Henry Gifford – www.henrygifford.com. "A Better Way to Rate Green Buildings."

Liberty Building Forensics Group – www.libertybuilding.com/
 McGraw Hill Construction – <http://construction.com/AboutUs/>

State of California – www.gov.ca.gov. Governor Schwarzenegger Announces First-in-the-Nation Statewide Green Building Standards." January 2010.

Articles

Brinson, Russ, and Dolan, James. "Emerging Risks of Green Construction." *Structure Magazine*. June 2008.

DelPercio, Stephen. "Shaw Development v. Southern Builders: The Anatomy of America's First Green Building Litigation." *Green Building Law*. August 2008.

Navarro, Mireya. *New York Times*. "Some Buildings Not Living Up to Green Label." August 2009.

Odom, J. David; Scott, Richard; DuBose George H. "The Hidden Risks of Green Buildings: Why Moisture and Mold Problems are Likely" *Florida Engineering Society Journal*. October 2008

Odom, David; Scott, Richard; DuBose, George. "The Hidden Risks of LEED: Avoiding Moisture & Mold Problems in Green Buildings." *Texas Architect*. September 2008.

Odom, David. "Strategies to Insure Your Green Project is Successful." *Liberty Building Forensics Group*. 2009.

Slivka, Jeffery. "Green Building Projects and Environmental Risks." *IRMI*. January 2010.

Watts, Meredith. "It's Not Easy Being Green...Or is it?" *Troutman Sanders LLP*

Presentations

Bidgood, Jim; Ponce de Leon, Dax; DuBose, George. Presentation: "Hidden Risks of Green Construction." 2009

Fairchild, Cynthia, Fairchild, Michael. "Green-N-Site: Green Buildings for Developers, Design Professionals, and Contractors." Presentation: AGC Annual Convention/Constructor Expo. 2009.

Gentilcore, Edward. "Help on Avoiding Red Ink, Red Tape and Being Red-Faced while Building Green." *Lorman Education Services*. 2009. Gentilcore, Edward Esq.; Bion, Howard; Sersen, Stan. *Lorman Education Services*. March 2009. Presentation: "Problems and Risks Associated with Green Construction."

Taylor, Thomas. "The Risk of Sustainability" Presentation: AGC of America Risk Management Committee Meeting. 2008

Vyas, Ujjval. "Green Building and Liability." Presentation: AGC Annual Convention/Constructor Expo. 2009.

Vyas, Ujjval, Ph.D., J.D., "Managing Contract Issues for Green Construction." *IRMI*. September 2009.

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