Commercial Building Energy Audits

Dinner and Program

Speaker:  Mr. Joel Altland, PE, FCSI, LEED AP, Mechanical Engineer, Barton Associates, York, PA
Audience:  Architects, Engineers, Product Representatives, Contractors, Building Owners

September 8, 2009

Mr Altland has over 30-years’ experience with designing environmental systems to efficiently condition buildings. In his work with existing buildings, he can demonstrate the importance of an energy audit and describe the level of audit, based on the latest ASHRAE guidance, that is most practical for a building owner. In his program he will cover the following:

Why do an energy audit?
What is an audit?
Who does audits?
What level of audit is right for the situation?
How do I go about procuring an audit team?
What do we do with the results?

Spouses, guests and visitors are welcome and encouraged to attend.

**RADISSION HOTEL**
1150 Camp Hill Bypass, Camp Hill, PA
Board Meeting - 5:00 p.m.
All members are welcome to attend the Board Meeting
Attitude Adjustment - 6:00 p.m.
Dinner - 6:30 p.m.
Program - 7:15 p.m.

**Dinner Cost**
Free for Central Pennsylvania Chapter CSI Members;
Students $10, All Others $25

Dinner reservations by noon, Friday, September 4, 2009
See FROM THE CHEF’S TABLE for Menu and Reservation details.
President’s Message

The Chapter’s summer break will be ending soon and we will back to our regularly scheduled monthly meetings and activities starting September 8, 2009. Although July and August were a break from our normal meetings, Officers, Board Members and Committee Members have been busy. The Programs Committee has pulled together a great schedule of programs and events for the coming year starting with an Energy Audit program presented by fellow member Joel Altland at our September meeting. In addition to these programs there are also plans for a tour, golf outing and a joint meeting with another professional organization.

On August 11, 2009 there was a planning meeting to review and discuss criteria for the "Outstanding Chapter Commendation Award" and how the Chapter might better accomplish the points required to receive this award. Jeff Snyder, Awards Chair provided some helpful insight on what Institute required and what input he needs from everyone to submit for this award. See the meeting minutes in the Sept. Choice for additional details on this meeting. One big item that surfaced during this meeting was the lack of Committee Co-Chairs. We still have several committees without Co-Chairs and I ask that anyone who may not be involved in Chapter activities to please contact me or any Chapter Leader about contributing some time in this capacity.

Also, please mark your calendar if you have not done so, for the Middle Atlantic Region Conference to be held in Charlottesville, Va., on October 8 -11, 2009. Don’t miss this great opportunity to meet and network with fellow MAR members, attend educational seminars and to tour Thomas Jefferson’s University starting with an Energy Audit program presented by fellow member Joel Altland at our September meeting. In addition to these programs there are also plans for a tour, golf outing and a joint meeting with another professional organization.

I hope everyone had a wonderful summer and look forward to seeing each of you September 8, 2009.

Don Scruggs, CSI, CCCA
President

Green Buildings

The Hidden Risks of Green Buildings: Why Building Problems are Likely in Hot, Humid Climates

By J. David Odom, ASHRAE, Richard Scott, AIA, NCARB, LEED®, AP and George H. DuBose, CGC, Liberty Building Forensics Group, LLC

The great irony of building green is that the very concepts intended to enhance a building’s performance over its entire lifetime are many of the same things that make a building highly susceptible to moisture and mold problems during its first few years of operation.

While green buildings have many positive benefits, there is also strong evidence to suggest a direct correlation between new products/innovative design and building failures. Simply put, departing from the “tried and true” often means increasing the risk of building failure.

Two strong characteristics of most green buildings are: 1) the use of innovative, locally-produced products and 2) the implementation of new design, construction, and operation approaches that are intended to reduce energy usage and be environmentally sound.

The hidden risks of green buildings: why building problems are likely in hot, humid climates

The graphic on page 4 summarizes some of the differences between green buildings and the concepts the authors have found in lower risk buildings. For example, lower risk buildings do not exceed industry guidelines on mechanically introduced outside air; but emphasize humidity control (especially in hot, humid climates). Green buildings, on the other hand, reward the introduction of innovations, on the other hand, reward the introduction of innovations.

From the Chef’s Table

MENU

London Broil or Flounder Almondine Mixed Garden Greens Chef’s selection of Starch and Vegetable, Chef’s selection of dessert Special Dietary menus, such as vegetarian, low fat or low sodium, are available upon request.

In addition, we will try to accommodate special requests such as vegetarian, low fat or low sodium selections. A fresh fruit plate, instead of the Chef’s Dessert Selection, is always available by request. Special request menu reservations should be made no later than the Friday prior to the Tuesday meeting.

Please feel free to forward either your comments regarding your meal, or any suggestions that you feel could improve the CPC-CSI dinner, to: loganmyers@hotmail.com.

Logan Myers
Hospitality Chair

RESERVATIONS

to Logan Myers by calling (570) 850-6330 or e-mail at loganmyers@hotmail.com or use our on-line registration form at www.cpc-csi.org

YOU MUST MAKE RESERVATIONS OR CANCEL STANDING RESERVATIONS by NOON.

FRIDAY, SEPTEMBER 4, 2009.

ALL NO-SHOWS WILL BE BILLED.

Entrée selection should be made when making a reservation. First entrée listed is the default selection if no choice is made.

Logan Myers
Hospitality Chair

Attendees should make an entrée selection when reservations are placed. (Please note that the first entrée listed will be the default selection if no choice is made.)
Minutes of Board of Directors Meeting

DATE: August 11, 2009  
TIME: 5:00 p.m.  
LOCATION: Ganflec  
209 Senate Ave.  
Camp Hill, PA

Attendees: Don Scruggs, John Groff, Jeff Snyder, Jeff Turicik, Jake Burkholder, Jan Myers, Stu Cluck, John Morgan, Paul Brunski, Phil Frigm, Joel All-land, Rich Forsberg

Don Scruggs called to Order at 5:02 pm

Current Business: A review of the requirements for the Outstanding Chapter Award
This will be covered in two (2) parts:
1) Review Committee Overlap & areas for mutual assistance  
2) Requirements by Category (to be handled by Jeff Snyder)

Requirements: Jeff Snyder: The requirements are available from Institute in the form of an editable WORD document.
Committee Chairs should fill these out and then email to Jeff Snyder along with PDF files of the required documentation.

Last Year’s Award Information and Documentation should be emailed to Jeff by September for submission.

Note: For the current fiscal year, fill out the form as you go, then it will be ready for submission at the end of the year without extensive research.

There should be a co-chair for EVERY committee.

Reviewed last Year’s submission with an emphasis on which areas we did not have points for. (Last Year we did not qualify for the Award.)

Membership: Maria Weber is chairman. Paul Brunski will be the co-chair.

Missing Items: New Member Orientation

Member Survey Articles

Approach: Paul Brunski will conduct a New Member orientation as new members are added. (He has a brochure outlining member benefits & etc. to hand out.)

A Survey could be added electronically to the Newsletter. (Jeff Turicik indicated that this would be possible.)

Articles could be submitted to the Newsletter on Membership related topics.

Education: Rich Forsberg is chairman. Don Scruggs is the co-chair.

Missing Items: Article

Approach: Encourage both Committee Members and Members to submit articles highlighting the benefits of membership.

Note: The requirements also encourage members to submit their qualifications to Speakers Lists for CSI. John Groff is a listed speaker on the topic of Master Format with CSI.

Technical: Chair: John Morgan, co-chair, Phil Frigm.

Missing Item: Articles

Approach: Encourage members to submit Articles on a Technical focus to submit to the Newsletter.

Note: Stu Cluck is the Region Chair for Technical and John Groff is a speaker on Master Format.

Certification: Paul Brunski is Chair, the other Instructors are co-chairs.

Programs: Jake Burkholder is chairman. Chris Atwood is co-chair.

Need to have programs selected 3 months in advance. Our schedule is well set for the upcoming year. September is set, October is in the process of being finalized.

Awards: Covered as noted in this discussion.

Jeff Snyder is on the Region Awards Committee.

Product Show: Received ALL possible points.

Finance: Received ALL possible points.

Publications: Received ALL possible points.

Scholarship:

Missing Items: Articles 
Support of Other Industry Funds

Long Range Planning: Received ALL possible points.

Social Activities: The Golf Outing qualifies as other social activity. Possibly we could have a separate Holiday Function and a Picnic in the off-season.

Elective Criteria: We obtained 18 of a possible 36 points herein. Possibly we could utilize Greeters. Table Top Presentations are another opportunity for points.

Currently, we do not have an Active Student Affiliate program. We could look into this with HACC and Harrisburg University.

It was suggested to look into Direct Deposit of Membership Dues.

Motion to adjourn was presented: Motion by: Jan Myers Seconded by: John Groff. Motion to adjourn was unanimously passed at 6:36 pm.

Respectfully submitted,  
Rich Forsberg, CSI, CCCA
Green Buildings (Continued from page 2)

more outside air than current industry standards, which can lead to indoor humidity problems and mold growth.

Green building environmental goals are typically organized around a set of nationally accepted benchmark guidelines such as those of LEED® (Leadership in Energy and Environmental Design), which is the guideline established by the United States Green Building Council (USGBC). LEED® certification is a checklist and point system of recommended practices where achieving various point levels can certify the building as having achieved silver, gold, or platinum status. These practices involve such issues as efficient water and energy use, the reuse of waste materials, and the use of renewable and regionally produced products.1

The overall goal of these new materials and procedures is to achieve a structure with reduced negative environmental impact — both during construction and throughout the building’s life. The intent of building green is unquestionably noble and good, and should be aggressively pursued. However, because of the dramatic change that this will present to the design and construction industry, its implementation will present new risks that are likely to be both technical and legal in nature.

Some of the legal risks are fairly obvious, such as the risk of not meeting a building owner’s expectation of achieving a certain level of LEED® certification (i.e., implied or even written warranties). Other risks are more obscure, such as:

- The failure of new products to meet their promoted performance levels, which is more likely with new materials compared to proven materials found in traditional buildings.
- Accepting the higher standard of care that a green building might present — what is currently considered “best practices” may now become the new expected “standard of care.”
- Failing to recognize (or prepare for) the unknowns in cost and schedule impacts that a green building might present.

It is even unclear if a LEED® certified building can be built under a design/build method without the construction team assuming huge amounts of unknown risks because of the vague definition of what is considered “green.”

The building industry has been historically conservative, relying on time-proven construction materials and methods. The introduction of new materials and methods has not always proven to be successful, and sometimes has resulted in notable building failures, especially those related to moisture intrusion and mold contamination. Many of the time tested materials found in lower risk buildings are hydrocarbon based. The long term efficacies and performance levels are unproven for some of the new carbohydrate based materials being promoted for green buildings.

The proliferation of new products and innovative building approaches related to green development is challenging the design and construction community in such a dramatic fashion. These changes virtually guarantee an increase in building failures and lawsuits. Past experience indicates that many of these failures will be predictable, and some are likely to be catastrophic.2

Examples of Technical Risks for Contractors & Designers

Moisture intrusion, whether bulk water intrusion through the building envelope or a relative humidity increase due to the heating, ventilating, and air conditioning (HVAC) system, results in a large percentage of construction claims in the U.S. Moisture intrusion not only results in building deterioration, but has been linked to occupant comfort and health issues, especially in those buildings that become contaminated with mold.3 Sustainable building practices, some of which are part of the LEED® accreditation process, can increase the potential for moisture intrusion if not carefully considered and implemented. Examples include:

- Vegetative roofs, which are more risky than conventional roofs (due to the constantly wet conditions) and must be carefully designed, constructed, and monitored after construction.
- Improved energy performance through increased insulation and the use of new materials, which may change the dew point location in walls, resulting in damaging condensation and a reduced drying potential for wall assemblies. Lower risk buildings emphasize the drying potential of the envelope over increased insulation. While it is desirable to increase insulation for energy savings, the designer must also evaluate moisture impacts.
- Use of new green construction materials that have not been field-tested over time. The designer needs to assess new materials and their risks compared to traditional materials found in lower risk buildings.
- Increased ventilation to meet indoor air quality (IAQ) goals that may unintentionally result in increased interior humidity levels in hot, humid climates. The designer must consider the increased energy load (and cost) and HVAC equipment sizing required to properly dehumidify a building when exceeding the minimum outside air requirements recommended by the American Society of Heating, Refrigerating, and Air-conditioning, Engineers (ASHRAE).
- Building startup procedures, such as “building flush out,” which could result

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in increased humidity levels and mold growth. Lower risk buildings rely almost exclusively on source control (which is also a green building goal) rather than relying on “flush-out” and increased building exhaust. Building “flush out” along with building “bake-out” were concepts developed in the late 1980’s by the indoor air quality industry, which often caused more problems than they solved.

New green construction materials are entering the market at a staggering rate. Because many of these products help to achieve multiple LEED® credits, designers working on green buildings are eager to specify these materials. The risk to contractors is that many of these new items are not time-tested, and designers often do not have the time to fully research their efficacy. If the new product fails, it may be difficult to determine if it is a design error, an installation error, or a product defect. Additionally, general contractors must rely on subcontractors to install new materials that they are inexperienced in installing.

Some of the expandable foam insulation products are examples of green materials that pose increased risks. The water absorption properties of these insulation materials can be quite different than what designers expect with traditional insulation. Additionally, some of the carbohydrate based foam insulation materials may retain more water than traditional hydrocarbon based foam insulation. Increased absorption of water into the insulation could negatively affect the wall performance. This is not to say that such materials should not be used; however, their properties need to be recognized and accommodated in the design.

The amount of ventilation (outdoor air) necessary for occupant health and comfort has been debated for decades. Although there are sound arguments on both sides of the debate, the emphasis on increasing ventilation to achieve LEED® environmental quality credits has increased the incentive to add more outdoor air to a building through its HVAC system (a minimum of 30% more outside air above ASHRAE recommended minimums is required to obtain a LEED® credit for ventilation).1

Increased ventilation is especially risky in the southeast U.S., where outdoor relative humidity levels are elevated for a good part of the year. Experience in the southeast, as well as other areas of the country with humid summers, has shown a direct correlation between the number of moisture problems and increased ventilation rates.

To effectively minimize the risk of moisture problems while increasing ventilation, designers may need to increase the complexity and capacity of the HVAC components and control systems to achieve proper dehumidification. This adds to contractor risk, since complex systems historically fail more often than simple systems. Additionally, the complexity of the system operation can result in unintended pressurization relationships where local depressurization causes humid outdoor air to be drawn into interstitial building cavities, causing condensation and mold growth.4

Building owners, designers and contractors all assume more risk when they deal with complex, and possibly untried, technologies not generally found in traditional buildings. Pinpointing whether the problem is design- or construction-related may be very difficult after problems have already occurred.5

Building startup procedures to meet LEED® credits include a credit flush-out of indoor containments using increased outdoor air either at the end of construction or during the initial occupancy period. The intent is to remove pollutants from off gassing of volatile organic compounds (VOCs) from new materials. The amount of air needed to meet the flush-out requirements places a building at increased risk because of the amount of moisture introduced with the increased outdoor air. LEED® requirements are that a minimum of 14,000 cubic feet per square foot of floor area is required for flush out. This presents multiple problems: most HVAC systems are not designed to dehumidify that amount of outdoor air which, in a 100,000 square foot building, is 1,400,000 cubic feet of outside air. Depending on outside conditions at the time of the flush-out as much as 240,000 gallons of water can be added to a 100,000 square foot building. This added moisture will be absorbed into building materials, finishes, and furnishings, increasing the risk of mold growth.6

Most specifications put the general contractor in charge of the flush-out, including controlling relative humidity levels during flush-out. If the system is not designed to handle such loads, the contractor is faced with a difficult challenge that may require the addition of a temporary, and extremely costly, dehumidification system. Lower risk buildings tend to avoid flush-out.

Conclusions

“'There's one sure way to kill an idea: Sue it to death.'” - Quote from ENR, July 2008

What is the greatest risk to the green building movement? It’s likely not the increased costs associated with green buildings—it’s more likely green buildings that don’t perform up to expectations and, in some cases, may experience significant failures.

The increased costs of litigation and insurance that could result from underperforming green buildings will be absorbed by designers (in a highly competitive marketplace), but in most cases will be passed onto building owners. These increased costs, along with the negative publicity on failed green buildings, could dramatically influence building owners NOT to build green.

Only recently has the marketplace began to recognize the various contractual, legal, and technical risks that are inherent to green buildings. A growing number of experts have suggested that the first two steps to improved green building risk management are to: 1) recognize the unique risks for green buildings. 2) Develop a set of guidelines that merge the unique regional challenges with green building guidelines, recognizing the lessons learned in lower risk buildings.

The design and construction community must not assume that if one builds green, then one will be building regionally correct or even lower risk buildings. Until the gaps between lower risk buildings and green buildings are addressed, the design community would be advised to prioritize the lessons of lower risk buildings already learned from the waterproofing, humidity control, and building forensics community. Without these priorities, poorly functioning green buildings are the likely result, and this could be the ultimate killer for the green building movement, especially in demanding climates.

In our opinion the solution to good performing, lower risk green buildings are at least three-fold:

o Development of a set of Climate Design Criteria that integrates (and prioritizes) climate-specific criteria with current green building practices. Best practices for moisture control must take priority over green building practices.

(Continued on page 6)
Calling All Reps!

Would you like to highlight your company or a special product? Do we have a deal for you. For a mere $125-$150 you can display your wares during the social time and have 10 minutes of everyone’s attention during dessert at one of our CPC/CSI dinner meetings. What an awesome opportunity to hit several specifiers at once. If you are a member of this chapter, it will cost $125. If you are not, it will cost $150. For more details, see the CPC-CSI.org website. To schedule a table top, call Jan Myers at 717.238.4910. Thanks!

Jan Myers
Advertising Chair

Central Pennsylvania Chapter of the Construction Specifications Institute
Table Top Display Registration

Name/Contact: ________________________________
Company: ____________________________________
Meeting Date: _________________________________
Telephone: ___________________ E-Mail: ____________
Cost: $125 members /$150 non-members (does not include meal)
Fee Includes:
1. One 72 x 30 inch table to display product.
2. Display time: 6:00 - 7:00 P.M. (During social hour)
3. Presentation: 10 minute presentation during desert.
Contact: _______________________________________
CPC ________________________________ Committee
717-______-__________

Green Buildings (Continued from page 5)

- Development of a detailed Green Building Risk Management Plan that provides guidelines for the design and construction team from concept through the 1-year warranty period. These guidelines would incorporate the best ideas of green building specialists, moisture control specialists, construction attorneys, and insurance companies.
- Apply the lessons learned from past building successes and failures and make green building concepts subservient to these past lessons.

Liberty Building Forensics Group, LLC (www.libertybuilding.com) is a firm that specializes in forensic building investigations and expert witness/litigation support. Its staff has led the correction and cost recovery for some of the largest building failures in the country, including the $60 million defect claims at Hilton Hawaiian Village in Honolulu and the $20 million Martin County Courthouse problems. Its staff has performed green building-related services on over $3 billion in new construction since the late 1990’s and has authored three manuals and over 100 technical publications.

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References
Sustaining Mr. Jefferson's Legacy: Designing For the Future

Central Virginia Construction Specifications Institute will be hosting the 2009 Middle Atlantic Region Conference in historical Charlottesville, VA on October 8-11. The conference will be held at the Omni Charlottesville Hotel, located on the city's downtown pedestrian mall at the heart of the city. Our conference theme is Sustaining Mr. Jefferson's Legacy, Designing for the Future.

Nestled in the foothills of the Blue Ridge Mountains, the city of Charlottesville is rich with history. Three of our nation's founding presidents lived in the area, James Madison, James Monroe, and of course Mr. Jefferson. There are many significant historical buildings dotted throughout the area, but none are so revered as Jefferson's University of Virginia. The UVA grounds are a magnificent testimony to Jefferson's aesthetics and ingenuity. The University rotunda is often recognized as one of the most important buildings in United States history.

The goal of our conference is to look at the University's past, and how that might shape its future. We will be focusing on two very large University projects that promise to be moving in a more sustainable direction. One of those projects promises to look into the healing power of building technology, the other, into how a building might promote learning and environmental responsibility.