SEAU *NEWS*

The Newsletter of the Structural Engineers Association of Utah

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This newsletter is a monthly publication of the Structural Engineers Association of Utah.

Articles or advertisements appearing herein may be submitted by anyone interested in expressing a viewpoint on structural engineering.

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The Utah State Capitol Building
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OCTOBER EVENT

AISC SEMINAR: BASIC DESIGN FOR STABILITY

Date:
Thursday, October 7, 2004
8:00 a.m – 4:00 p.m.

Location:
State Capitol House Building
Room 135

Cost:
$50.00 for current SEAU members.
(Students $30.00, Others $150.00)

MESSAGE FROM THE BOARD

THE WRITTEN AND UNWRITTEN RULES OF ENGINEERING

By Julie Ott,
SEAU Vice President

As engineers we all understand the basic principles of engineering: 1) F=ma 2) 'Stuff" dose not flow uphill and 3) You can't push on a rope. These basic rules are written. We all spent at least four years studying, memorizing, and analyzing to prove them. Though the unwritten rules (key word ethics) are perhaps mentioned in a Laws and Rules class, where ethics was a 15-minute topic. Yet ethics is always a hot topic.

We have:

- SEAU News articles talking about aspects of ethics
- Employers harping about one point of ethics
- All of us pointing out the unethical practices of others (in lieu of reflecting on our own short comings)
- The UofU engineering students now being required to write an Honor Clause on homework papers proclaiming they did not cheat
- A few states requiring ethics training as part of the continuing education program,

(continued on page 4)

FOCUS

Salt Lake City and the greater Wasatch Front are growing into a major metropolitan region with many interesting buildings that define our historical, business and cultural qualities. SEAU NEWS will highlight some of our most interesting and important buildings over the next several months. (If you have a particular interest in a building you would like to see highlighted in this space, please contact the Newsletter Committee). This month the focus is on:

Utah State Capitol Building

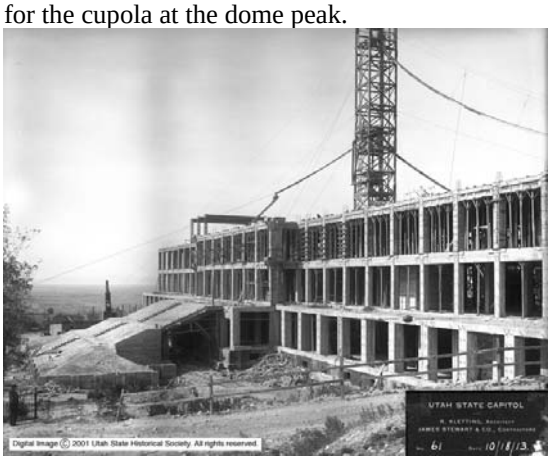
by Cameron Empey

For nearly 100 years the Utah State Capitol has stood resolutely above the Salt Lake City landscape. During this period it has been witness to the expansion and growth of Salt Lake City. While there are many other wonderful buildings that have been constructed since, the Capitol has not lost its standing as one of Utah's premier structures. Construction began on December 26th, 1912 and the building was dedicated on October 9th, 1916 for the modest price tag of 2.74 million dollars. Today the Capitol Preservation Board will spend nearly 100 times that amount in order to ensure that the Capitol will continue to impress visitors for many more years to come.

Utah State Capitol Building Jeff Schmerker

The Capitol Commission appointed by Governor William Spry awarded the design of the Capitol Building to Richard K.A. Kletting. As one of Utah's most prominent architects, Kletting was well qualified to create a monument equal to those found in other great cities, while also incorporating the charm and character unique to the state. The commission, led by Kletting, toured the nation to research other Capitols and glean design concepts that would aid in the formulation of his design. Much of his inspiration came from the U.S Capitol as witnessed by the drum and dome details of the Utah Capitol.

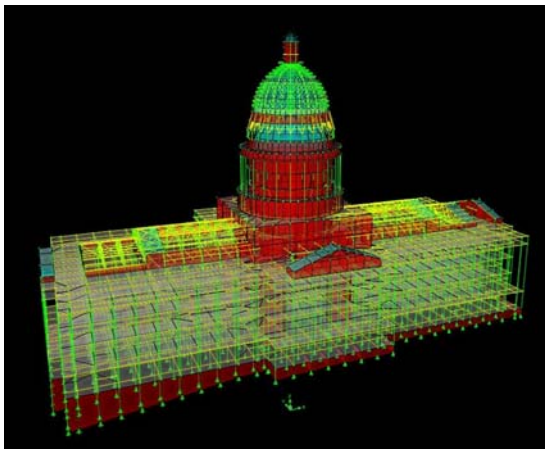
In addition to having a first-class reputation as an architect, Kletting also possessed innovative engineering skills. The level of thought that was incorporated into the structural system of the Capitol was well ahead of other structures of the day. The building was designed as a steel-reinforced concrete frame. Two types of reinforcement were used on the building; smooth bar and twisted square steel. The dome is constructed of arched steel open web trusses connected to trussed rings at the bottom and the top of the dome. This framing also provides support for the cupola at the dome peak.



As advanced as the structure was for its time, it is not capable of resolving the forces of a large seismic event. The structure is inherently non-ductile due to the low amount of steel reinforcing and the lack of sufficient detailing at the connections. In addition, the concrete is inconsistent throughout the building. Some samples taken have had compressive strengths of less than 1000 psi. The attachment of the granite cladding in the building is marginal at best, creating a high potential for falling hazards. The only lateral connection between the individual blocks of the exterior stacked granite columns is a one inch diameter steel pin at the center of the blocks. Utah lawmakers, along with architects and engineers, developed a plan to seismically retrofit the Capitol. This plan has now been initiated and will take approximately four years to complete.

One of the first steps in this renovation was to create a structural computer model of the Capitol. The engineering team chose ETABS Nonlinear software to create a sophisticated and accurate model of the existing Capitol. The first task after creating the model was to determine the current behavior and capacity of the building. The fundamental mode shape of the building was found to be torsional. This is largely due to the four massive concrete columns that support the rotunda.

These columns produce a stiffness irregularity at the center of the structure causing the deflection of the more flexible wings to be significantly amplified. Another significant deficiency found was the behavior of the dome. Accelerations in the dome are expected to be 5 times greater than the accelerations at the base. The extensive use of windows in the rotunda, augmented by the use of concrete in the dome, creates a soft story condition. This soft story condition dramatically amplifies the accelerations of the dome.



Base Isolation was selected as the most effective retrofit option. The design will allow for 24 inches of displacement in any direction. The base isolated model produced a design that achieves the Basic Safety Objective of FEMA 356. Dome accelerations will be reduced to 3 times that of the base (a 40% reduction). A non-linear analysis of the stacked granite columns was completed for both the rigid and base isolated condition. For the rigid condition, the analytical deflections were well beyond complete structural failure. For the base isolated condition, the safety factor of the current column configuration is between 1.5 and 2.0. Other modifications will also be completed above the basement to increase the stiffness of the overall building. Several concrete shear walls will be added (particularly around the perimeter) in order to counteract the torsional mode shape previously discussed. The dome and drum will also be retrofitted with new, lighter weight stone terracotta.

The chief component of the isolation system will be lead core vulcanized rubber bearings. A small number of natural rubber bearings and Teflon coated slide bearings (sliders) will also be used. The existing columns will be supported by a grid of 60”x 30” concrete beams that will in turn be supported by the isolators. The isolators will be placed on a continuous mat foundation. In order to preserve the architectural elements above, a stringent deflection criterion of 1/16” has been used in the design of the load transfer mechanisms.

A key feature of the transfer system is the use of direct friction to suspend the existing columns instead of a mechanical device. The existing columns are tapered to create a wedge which will engage new concrete transfer beams. Special reinforcing is used in the beam to prevent separation between the face of the column and the beam. To ensure that this untested procedure would provide the desired result, the design team created a full-scale mockup of the system on one of the columns in the Capitol. It was successfully tested to a safety factor of 2.0 with no measurable slip between the column and the beam.

In addition to the friction connection that will be used throughout the building, the load transfer of the columns supporting the rotunda is also noteworthy. New concrete beams and girders will also surround these columns utilizing post tensioning to clamp new concrete transfer beams to the existing columns, allowing the soil underneath the existing footing to be removed. With the addition of the new concrete, the load at each rotunda pier will be approximately 10,000,000 lbs. Even though this is a substantial load, only 10 isolators per column will be required. The bearing pressure underneath the footing at these locations will be close to 20 ksf. The allowable bearing pressure provided is only 3000 psf. A system of micro-piles will be installed in order to densify and stabilize the existing soils to bring the capacity up to the required 20 ksf.

The success of the original building is due in great part to the innovative engineering skills of Richard Kletting, The current renovation will not only preserve the Capitol’s exceptional presence as one of Utah’s premier structures, but will add to the history of this remarkable building. For more information on the plans and progress of the renovation, visit the Capitol Preservation Board website at www.cpb.state.ut.us.

MESSAGE FROM THE BOARD (continued from page 1)

But what ARE the rules?

Do we expect young engineers to simply learn ethical conduct by following the example of their leaders? As Barry Arnold wrote in his article last month, People Making a Difference (PMD) are prime examples of individuals we can all learn from, and then there are the People Making Statements (PMS) who we can also learn from – although these are generally the folks whom you learn what not to do from.

I ask these questions of education and guidance from an observation at the recent Fall Social. At the Social, Barry's efforts were reward with an excellent turn out from the membership, and I was pleasantly surprised at the influx of younger members that were in attendance (they must be *younger* since I am young and to my knowledge no one else is getting older either). I wonder if the new group of engineers received more in-depth ethics training – I somehow doubt it. So if we are to preach ethics shouldn't we lay down the groundwork? The following are three excellent resources:

1 - SEAU Code of Ethics. The gentlemen who put the guidelines together did an excellent job. All of the points are very simple. If you've ever read the "All I really need to know I learned in kindergarten," the Code of Ethics is kindergarten for engineers. Though I think we all can go back to kindergarten and review. As a matter of fact it appears that many of us have never even been there! I questioned quite a few SEAU members and the majority didn't know the Code of Ethics existed. Some indicted they read them once, but didn't have a copy.

http://seau.org/members/CODE_OF_ETHICS.pdf

The SEAU Code of Ethics is on the web site available for the world. I highly recommend you read or reread it. In fact download it into your palm pilot or my personal preference – print it out and put the Code in your 'Goals' file. When you review your goals reread the Code of Ethics – it's always a good review for all of us.

2 - *"A Professional Guide for Young Engineers,"* by William E. Wickenden as edited and Collated by G. Ross Henninger is also an excellent reference for all engineers. This old guidebook includes the "Faith of the Engineer."

3.- ***"The Unwritten Laws of Engineering,"*** by W.J. King. This paper was originally published in the May, June, and July issues for *Mechanical Engineering* in 1944. I have seen reference to this paper being republished several times, and though the words were written ov 60 years ago, they are still appropriate for all engineers today.

So how do we advance? For an individual to grow we must be more focused on our own appropriate actions prior to worrying about our fellow engineers. As an organization and profession, we can all review the Code of Ethics and papers mentioned above to be prepared for an appropriate open discussion at the December 9, 2004, SEAU meeting on the "Standard Of Care Document Review," and the tentatively scheduled February 17, 2005, "Ethics Refresher."

NCSEA CONVENTION REPORT

By Craig Cartwright

This years NCSEA convention was held in New Orleans and, as Barry Arnold can attest, it is one bead-happy city. Yes, beads are everywhere and Barry and I are still trying to figure out why they're so popular. We still have ours but many just simply gave them away. It's hard to imagine 50+ structural engineers emerging onto Bourbon Street with no warning but it happened and it wasn't a pretty sight. Although, come to think of it, Barry seemed to fit in just fine.

During the day was a different story. Sixteen hours of meetings has a sobering effect, which I am pleased to report, was all about Zen and the Art of Structural Engineering. OK, enough high jinks. Here are the highlights of what we learned:

Codes and Standards development

The NCSEA Code Advisory Committee is working with both ICC and NFPA to develop uniform structural engineering requirements. The goals are to get the model building codes to refer all material design requirements to material standards such as AISC, NSD, ACI, and lateral force determination to ASCE-7. Gravity loads will remain in the IBC code. The codes will, however, contain the "triggers" that determine when and what loads are to be used. Codes and standards will be published on a collateral track and be increased to a five-year cycle instead of three years. ASCE-7 will contain a new simplified wind load section that is designed to cover over 75% of buildings. Basically, buildings three stories and less, with

diaphragms loaded directly by the walls will be eligible (no metal building-type systems).

Inter-professional Relationships

CASE and SEI reported on their coordinating efforts with NCSEA. Basically CASE and SEI try not to overlap NCSEA's efforts. CASE does very well with business and contract issues but SEI tends to overlap quite a bit more. In case you didn't know, SEI was formed to stop the hemorrhage due to the rapid loss of structural engineers as a result of feelings of disenfranchisement.

Since the demise of SERMC, CASE is trying to resurrect the program but without the alliance with big insurance. Their Risk Management Program is off to a good start with a two-day Convocation scheduled for November 5th and 6th in Reston, West Virginia at ACEC Headquarters. The Convocation is open to all interested structural engineers. More information can be found on the ACEC/CASE web site.

Structural Licensing

NCSEA is still advocating the goal of Practice Acts in all US jurisdictions. This is almost an insurmountable task but one that NCSEA believes will be successful if continued pressure is used. Any jurisdiction that wishes to pursue a Practice Act will receive support from NCSEA in the form of financial and intellectual backing. NCEES made a presentation on their new Structural Engineering Model Act qualification program. It is part of the existing records program but they will issue a certificate authenticating that your education, experience, and examinations comply with their Model Act.

Structural Certification

The structural Engineering Certification Board (SECB) has been organized and is accepting applications. However, there remains an element of uncertainty pertaining to the credentialing requirements past the grandfathering phase. The complete organization is scheduled to occur by January 1, 2005. Several Utah engineers have already applied. I would hope that every one of Utah's serious structural engineers would also apply prior to 2005, if not sooner. The requirements for grandfathering are quite simple. To qualify, an engineer must be licensed to practice structural engineering (not necessarily as an SE) in any jurisdiction of the United States prior to July 19, 2005, must also have been actively engaged in the full-time practice of structural engineering for three years prior to application, and pay the required fee. The SECB ***does not*** declare the engineer to be a Certified Structural Engineer but, rather, certifies the engineer in the practice of structural engineering. After July 19, 2005 an engineer can still apply for grandfathering at any time if the same requirements are met and the applicant pays all past years dues and can verify continuing education credits for the missed years. If an applicant does not qualify, or desires not to apply, for grandfathering, the requirements will most likely consist of education, experience, and test achievements similar to most state licensing requirements. Contact me for more information as I am the marketing chairman for the SECB.

Publications

Structure magazine is growing in size and maturity. The articles are steadily improving in content quality and reader acceptance. Advertisers have gradually seen the improvements and are supporting the magazine as well. The Publications committee Chair (me!) made a passionate plea for more individual engineer involvement. The magazine exists solely for the benefit of SEA members. Therefore, all structural engineers are encouraged to submit articles for publication. Contrary to popular belief, every engineer has something to contribute and STRUCTURE wants to hear about ingenious or clever achievements regardless of size or prominence. By the way, STRUCTURE magazine is almost entirely financed through advertisers. If you ever contact one of the advertisers, even if you're just casually interested, P L E A S E ! mention to them that you read about them in STRUCTURE magazine.

Summary

It's hard to comprehend all of NCSEA's efforts with just a newsletter article once a year. I have been the SEAU delegate to NCSEA since 1997 and I can see an outstanding improvement in NCSEA benefits to the profession since its humble beginning a few years earlier. In those early years, NCSEA struggled with membership (8 original SEA's and now 38) and finances. Now, NCSEA is considered the voice of structural engineers nationwide and is financially healthy. Watch for more NCSEA news next year, same time, same place.

TECHNICAL ERROR OR PRACTICE MANAGEMENT ERRORS

By G. Dan Bradshaw, CPCU
American Insurance and Investment Corp

I'm often asked what benefit would inure to a design firm to practice any risk management practices, would such practices effect a firms insurance premium.

From my perspective working with design firms for the past 16 years there are many benefits from practicing risk management techniques. Firms that are pro-active on these issues experience lower insurance premiums, due to less claim activity.

We have been through some unprecedented times the past 10 years. Construction in the United States has expanded at unprecedented levels. Many firms were working at their maximum capacity and would have hired additional professional people if they could have found them to hire. Through this great busy period some firms may have gotten lazy about their business practices. After all work was plentiful, cash flow was good and often there wasn't time to analyze projects routinely for profitability, and not enough time due to fast deadlines to Quality Control projects before they left the office.

In this same period Insurance rates lowered to all time lows so a lot of firms figured avoiding risky projects and having claims didn't really matter anymore. The fact is those happy times came to an abrupt end as the country fell into recession and professional liability claims skyrocketed as did premium levels.

Research done by looking at over 500 claim files from this period of time, reveals some interesting trends. Technical errors are an element in most every claim file. Things show up like a lack of coordination, poor detail, discrepancy in specifications and so forth. Also present are business practice issues like lack of a contract or bad contract language, poor communication, taking on a very risky project type for a inadequate fee. Many times the firms' poor business practices made solving the technical error a more expensive problem.

In some of the most difficult and expensive claims the designers negligence was questionable; but they were in the suit because of poor business or contracting procedures.

Often the clear-cut errors are the easiest to settle because you can easily determine what the costs will be to correct the problem.

A firm can often control the intense technical areas of a project so as to not create an error; these practices are often called Quality Control and Quality Assurance programs.

A firm can also manage their business practices in the same manner, which will lessen a technical error, and help in making the firm defensible in the event of a claim or allow the problem to be solved more quickly.

An Insurance practice called Risk Management can be applied to each side - the technical side and the practice management side.

Control the Risk
Avoid the Risk
Transfer Risk
Assume Risk

Let me give examples for each perspective from each technique:

Control the Risk

Technical side - Develop a Technical Quality Control Program. This is more than checklists, this is creating guidelines and tools within the firm so that sound design using standards becomes the culture in the firm. Quality assurance programs are simply procedures so that work is double checked by others before it leaves the firm. From the Practice Management side the tool here might be to develop a pre project selection form to quickly review the merits of a new project and try to measure how risky it might be for the firm to do the work based on the expertise required, the time schedule and the amount of fee.

Avoid the Risk

Technical side – use of peer review on a design so that others who aren't so close to the project can give input on solutions not explored by the primary design team.

From the Practice management side through the use of a checklist, you might turn away a client who you learn is slow to pay their our bills

Transfer Risk

Practice management side - use a limitation of liability clause with a lower limit because of projects riskiness.

Technical side – rather than hiring a specialists sub consultant on a project, have the owner hire them directly and contract to coordinate the work and be given the right to relay on the accuracy of the work contractually.

Assume Risk

Practice management side - Use a good contract with a limitation of liability clause. Document and confirm all communications including email, project notes and correspondence.

Technical side - Design using standard details, using adequate QA with cross checking of design by others.

PRESIDENT'S MESSAGE

Self Serving or Serving the Public?

Too many times engineers hide behind the excuse that something is, or will be viewed as being, "self serving" as a reason not to speak out or take action. For me that reasoning is illogical. When you became licensed, your primary obligation is for the health, safety and welfare of the general public regardless of the potential for some personal benefit.

The root of the problem is that most engineers have limited respect for what they do for a living. Combine that with an incredibly narrow field of vision which prevents them from seeing the big picture and you have a great equation for inaction.

Ask a structural engineer what he does for a living and you will get some canned answer like "I design footings, columns and roof structures, etc". That may be an answer but it is not the right answer. The right answer is "I save lives for a living". You may not save lives on a daily basis, like a doctor, fireman, police officer etc., but when the time comes via earthquake, hurricane, etc. a properly engineered building will in fact save lives. Period. That is the big picture. Structural engineers are in the business of saving lives.

Can anyone deny that it is in the best interest of the public to use an engineer skilled in the practice of structural engineering to be responsible for the design of buildings and other important structures? If that is the case, then shouldn't we push for a practice act in this state? A practice act would ensure that structural engineers were an integral part of every project. But, some will say that pursuing that course will be viewed as being self serving. Nonsense! It is serving the best interest of the public.

Barry Arnold SEAU President

ON ETHICS by DEBORAH LONG

Jerry Maguire:
An Ethics Lesson

One of the many myths that exists about ethics is that adults are incapable of becoming more ethical. In other words, some believe that once we have reached adulthood, we are either ethical or not. Research studies, however, indicate that adults are not only capable of learning to be more ethical, but that we are likely to experience the greatest leaps in moral development in our twenties and thirties. During this period, we are likely to experience transformative life events: for example, our first significant job, marriage, and parenthood.

A good example of how an adult can become more ethically mature can be seen in a 1997 movie about ethics in sports, Jerry Maguire. Maguire is a sports agent who experiences major moral growth in terms of personal and professional relationships. Early in the film, we see Jerry's many character flaws. We watch Maguire dazzle his clients with imaginary propositions about six- and seven-figure contracts, offers of high- paying endorsements, and phony promises of greater glory on the basketball court or the football field. In another scene, Jerry's business friends mock his inability to sustain personal relationships, a character defect that is underscored by Jerry's inability to be alone. In yet another early scene, one of Jerry's clients is so badly hurt on the football field that he is hospitalized. Rather than encourage his client to recover and perhaps retire due to the athlete's numerous injuries, Jerry encourages him to get back on the playing field as soon as he can, mainly to bolster Jerry's commission income. When confronted by the hospitalized athlete's young son, Jerry is shamed into realizing the degree of his selfishness. This experience is the triggering event for Jerry's ethical transformation.

Jerry writes a mission statement where he proposes that his firm should have fewer clients and develop better relationships with the clients already under contract. He sends multiple copies of his mission statement to his colleagues. Unfortunately, Jerry's new goal is at direct odds with his company's objectives, and ultimately, he is fired.

He suffers yet another setback. As he furiously attempts to establish his own agency and woo new clients, a prospective client refuses to sign an exclusive contract with Maguire, stating instead, "My word is as strong as oak." Later, the client signs an exclusive contract with a competing firm, and merely shrugs when Jerry reminds the client of his verbal promise.

At this point, Jerry's one remaining client and his loyal assistant bolster his flagging spirits. Maguire's ethical transformation begins with a commitment to honesty in relationships. Jerry realizes that his past misrepresentations and partial truths have hurt his clients, and now, even if it means he will lose clients, he advises them of potential risks as they seek to renegotiate their contracts. He begins to experience compassion for his

client: we see Jerry's moral growth when he is clearly overwhelmed by feelings of concern and guilt when his one remaining client is injured on the field. Jerry also learns the importance of promise-keeping and trustworthiness, particularly when he begins to establish a personal relationship with his assistant and her young son. Maguire realizes that an ethical individual makes every reasonable effort to fulfill the letter and spirit of their promises and commitments. Jerry also learns the meaning of loyalty when his one remaining client and his assistant stay by his side as Jerry struggles to remain financially solvent

Jerry Maguire also demonstrates the importance of ethical mentoring. While Jerry is ethically immature in many respects, he is able to nurture ethical qualities in others. He reminds his only client of the joy of playing football just for the sportsmanship and to give up his obsession with "show me the money." Jerry's assistant remains by Jerry's side because she is inspired by Jerry's leadership. The importance of mentoring is underscored by the many scenes of father-son relationships in this complex film and how these parental or parent-surrogate figures are so important in sharing and teaching values. Jerry not only teaches and inspires others to be better, he is also taught and inspired by others. Through support and mentoring, Jerry Maguire learns the value of respect, accountability, and commitment to excellence and integrity.

Jerry Maguire demonstrates that adults are capable of change. Becoming an ethical person is part of a lifelong struggle for character. Maguire also reminds us of John Ruskin's maxim: "The highest reward for a person's work is not what they get from it, but what they become by it."

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BULLETIN BOARD

BULLETIN BOARD SPECIAL FEATURE

This month SEAU would like to feature:

SUSTAINABILITY AND THE ROLE OF THE STRUCTURAL ENGINEER

By Christopher Hewitt, paraphrased for SEAU Publication by Jerod Johnson, P.E.

In recent years environmental awareness in building construction and design has becoming more and more of an issue. As structural engineers, most of us have at least heard of the US Green Building Council's LEED™ Rating System. So, what is a LEED (Leadership in Energy and Environmental Design) certification? The LEED certification is awarded to high performance, energy efficient buildings and gives designers a way to market building performance to owners, and gives owners a basic idea of the energy and environmental efficiency that they are getting in their building.

A LEED certification is attained by earning a certain "points" in any of 64 areas highlighted in the LEED rating system. These points are awarded for incorporating "green" initiatives into a building project. Green initiatives might include sitework protection, the use of efficient HVAC systems, or the selection of building materials that have a reduced environmental impact.

Although most structural engineers have heard of LEED, few really understand what it is. Of the 41 different initiatives (called credits) that are addressed in the LEED rating system, only a few directly impact the work of the structural engineer. Under LEED version 2.1, the most recent edition of the rating system, the choices of the structural engineer on a building project most directly affect the following items, which are presented in order by how often they are achieved on LEED rated projects:

Use of locally and regionally available resources
Recycled content of materials
Construction waste management
Use of certified wood, when applicable
Reuse of building materials
Reuse of an existing building

Many of us at some point in our careers will be involved in a project where LEED certification is at least considered. So, what are the structural issues related to LEED Certification? As a structural engineer interested in contributing toward a LEED rating on your project, you should, at a minimum, consider the following:

Use of locally and regionally available resources

Consider the availability of your materials with respect to the project site, and try to cut down on transportation impacts. Most structural materials are available within the 500-mile distance specified by LEED to every project site in the United States,

but to keep with the intent of this credit, certain sources, like imported sources of cement or steel, will have to be avoided. It is important to note that within the context of LEED there are two different points available in this credit category - one is awarded for projects that use products that are manufactured within 500 miles of a project site and another is awarded for projects which use products that are extracted within 500 miles of a project site. The first credit for local manufacture of products is rather easy to obtain - only the steel fabricator or the batch plant need be within 500 miles of the project site. The second credit for local extraction of materials requires that the raw ingredients for the product (ie. the recycled steel scrap source or the cement and aggregate sources) also be within 500 miles of the project site.

Recycled content of materials

The structural frame is very often applied toward this credit, whether the system uses structural steel, which has 90-95% recycled content from mostly post-consumer uses, concrete with pozzolans such as fly-ash, a coal combustion by-product that can replace 20-35% of the portland cement used in conventional concrete, or composite wood products, which can have varied levels of recycled content depending on their application.

Construction waste management

This credit is awarded for practices during the construction of the building that reduce the amount of material that is ultimately sent to a landfill. By using materials that arrive on site as completely assembled products, the total amount of waste generated during on site construction is reduced. In this way the use of completely fabricated products such as steel beams and precast concrete members, whose production waste is controlled in the manufacturing process, can avoid on-site waste that is difficult to control, such as that generated from scrap pieces of cut products or conventional formwork with a limited reuse life.

Use of certified wood, when applicable

If structural timbers are used on a project, the designer should specify that they be responsibly forested. This avoids the clear-cutting of forests and lessens the environmental impact of collecting this material.

Reuse of building materials

The reuse of building materials requires a material source that can be extracted intact and reused in a new building. Steel and precast concrete are potential sources of reusable structural material, as the products arrive on site as discrete net-finished components, which can be easily demounted from a structure without a loss of strength. Structural timbers can also be reused, but wood products are more often reclaimed as siding material rather than structural members.

Reuse of an existing building

The ability to upgrade an existing structure for a future use is important to meeting this credit, and as such, if this credit is sought, substantial assessment of the existing structure will have to take place to identify the suitability of the structure for receiving new loads. The use of durable and adaptable materials facilitates the reuse of structures. Design structures that can adapt to future expansion of use, and structures that will be easy to upgrade to unexpected loads, should this become necessary

Innovation and the design process

The final credit category presented in LEED is meant to encourage innovation. Only the reaches of the imagination limit the ways that a structural engineer can contribute toward this credit. It is within this mechanism that new environmental technologies will emerge and the face of sustainable construction will transform. Successful past strategies have included optimizing the use of materials in a structural system beyond that which is called for in typical design, and highly integrating the work of the mechanical, electrical and structural trades to increase the overall performance of the building. In this credit category, all of the members of the project team are asked challenge today's conventions and to look toward the future.

LEED empowers and challenges all members of a building project team, including structural engineers, to push the envelope of design to sustain our communities, environment, and atmosphere in the midst of a fervently competitive world. As evidenced by LEED's continued growth, the construction market is responding to the challenge, improving the performance of our buildings, and ultimately building the image by which future generations will remember us.

You may see Christopher Hewitt's entire article in the October 2004 edition of Structure Magazine. *Christopher Hewitt is a Staff Engineer in the AISC Engineering and Research Department and a LEED Accredited Professional.*

AISC provides several resources on how steel can effectively contribute toward a LEED rating. For more information on steel's role in sustainable design, please visit www.aisc.org/sustainability.

EDITOR'S CLARIFICATION

Last month's Special Feature Article on Mold and Mildew was compiled from an article of the same title by Richard Cox and published by SEAOCC. Inquiries for the full text can be made to SEAOCC at SEAOCC@aol.com. Richard Cox can be reached at cox-rg@att.net.

BULLETIN BOARD

SEAU BENEFITS

The board of SEAU has taken what we consider to be a great step forward: We have obtained the ability to accept Master Card and Visa as payment for membership, seminars, etc. This step is a critical advancement to offering convenience to the membership. It enables members to send last minute registrations via fax or just avoid the hassle of writing out a check and finding a stamp and an envelope.

Looking over the last year, the benefits of belonging to SEAU become very clear. The monthly newsletters contained valuable information to keep the members on the cutting edge of technical knowledge, as well as keep them informed about the industry. Public review periods for various code documents were announced via email to give the members a chance to participate in the code making processes. The membership has been notified of several seminars that are available for CEU credits, whether or not sponsored by SEAU. For those seminars offered through SEAU, cumulative savings of $170 were extended to our members for several high-quality educational opportunities, as well as several "free" evening meetings with exceptional speakers and cutting-edge knowledge.

The benefits of your membership to SEAU are truly numerous. We encourage you to take advantage of the many benefits and to get involved in the difference that we are making in Utah by contacting the chairs of the various committees and notifying them of your interest.

Kim Robinson, SEAU Treasurer

SEAU GOLF TOURNAMENT WINNERS

Thanks to all those who participated in SEAU's annual golf tournament and congratulations to the winners!

First Place: $50 Gift Cards to The Sports Authority

Matt McBride (ARW)
Justin Naser (ARW)
Larry Christiansen (Dean L. Webb & Associates)
Shawn Witzel (Dean L. Webb & Associates)

Second Place: 8 Days / 7 Nights Golf Vacation to Maui (or $30 Gift Cards to The Sports Authority)

J.R. Richards (RCG)
Ron Dunn (Dunn Associates)
Dave Pierson (ARW)

SEAU MEMBERSHIP APPLICANTS

The following individuals have submitted applications for approval by the SEAU membership committee for new members:

Mitch Mortensen	Professional
Don L. Naser	Professional

CLASSIFIDES

STRUCTURAL DESIGN ENGINEER
DRAFTING / CAD

Reaveley Engineers & Associates, Inc. has a position available for a self-motivated structural engineer and CAD Drafter.

Structural Engineer: If you enjoy working on challenging projects using state-of-the-art-engineering solutions, have reasonable verbal and writing skills, and want to learn new methods to solve problems, we would like to hear from you. Projects may include new construction or renovation of existing buildings, seismic base-isolation, Buckling-Restrained or Eccentric Braced Frame systems, and Linear Dynamic, Non-Linear Static (push-over), or Non-Linear Time-History seismic analysis procedures. A masters degree is preferred (but not required) in civil engineering (structural emphasis).

Drafting / CAD: Full time CAD Drafter with AAS Degree and AutoCAD training. Arch, engineering or construction experience helpful. Stable work history required.

Send resume to:

Reaveley Engineers & Associates, Inc.
1515 South 1100 East
Salt Lake City, Utah 84105

Engineering position Attn: Parry Brown
Drafting position Attn: Greg Cazier

Phone: (801) 486-3883
Fax: (801) 485-0911

ADVANCE NOTICE FOR NOVEMBER 2004 MEETING

The Structural Engineers Association of Utah

has teamed up with

The Utah Chapter of ICC

and

The Bonneville Chapter of ICC

for a seminar on

Structural Plan Review

Date: Thursday, November 18, 2004

Time: 4:00 to 6:00 PM

Location: Salt Lake County Council Chambers, 2001 S. State St, North building, near the main entrance.

We plan to have a panel of engineers, plans examiners and building officials to discuss structural plan review, and the general concept of peer review.

Modern homes are among the most complex structures that a building department has to deal with, and in fact, even for the engineers, are among the most difficult to analyze properly.

And commercial buildings are now built under codes that have become increasingly complex over the years. Even the finest engineers can make a mistake, and will appreciate someone finding it before it is "cast in concrete."

Please come to this seminar/panel discussion and bring your questions and ideas.

There is no charge for this seminar!!

SEAU Presents:

Basic Design For Stability - Columns and Frames

AISC Seminar

Date: Thursday, October 7, 2004

Time: 8:00 a.m. – 4:00 p.m.

State Capitol House Building Room 135

Presented by Joseph A. Yura, Ph.D., and Todd Helwig, Ph.D.

Registration is past due as per previous announcements. Call Julie at 333-7676 for any questions. Late registrants are not guaranteed handout materials.

SEAU Members $50.00, Students $30.00 ($40.00 including SEAU membership), Others $150.00

6.0 PDHs

This seminar has partial funding provided by the Division of Occupational & Professional Licensing from the 1% surcharge funds on all building permits. SEAU and AISC gratefully acknowledge DOPL's kind contribution for the education of engineers in the State of Utah.

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