



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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One Utah Center

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MARCH EVENT

ENGINEERING ETHICS

Presented by:
Dr. Jimmy H. Smith

Date:
Thursday, March 17, 2005
5:30 p.m. Social Hour
6:00 p.m. Presentation

Location:
EMCB Room 103
University of Utah

MESSAGE FROM THE BOARD

ETHICS, SEAU, AND YOU



By Ron Dunn
SEAU Past President

Your view of the world is centered around your sphere of competence. One is only really aware of their own areas of partial ignorance. Unfortunately we have a very difficult time of identifying our own ignorance zones. As we look back upon our years of formal

education, knowledge gained since, and how we are positioned to gain knowledge from this time forward; how does this knowledge affect others? Have we studied how to respect others, promote others, and help others to succeed? Or, have we been otherwise preoccupied in how we can individually become more proficient, important or better equipped to solve the latest engineering assignment?

What we "know" is oft times a greater obstacle than what we "don't know". Clearing our minds of prejudice is as difficult as pushing all the air out of a room. Sometimes we become too close to resembling a machine. Which from a pure accounting point of view is a good thing?? On a typical profit and loss statement, people are treated as an expense and machines are treated as assets!

CONTINUED ON PAGE 3

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 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:

One Utah Center

by Rick Seelos

The One Utah Center is a major building that is a significant part of downtown Salt Lake City's skyline. It was constructed in late 1989 and completed in early 1991 by the Boyer Company as part of the Block 57 Redevelopment Plan. This block also houses the American Stores Tower, the Salt Lake City Marriot, and the Galivan Center.

The building consists of 23 stories with a penthouse and basement for just over 440,000 square feet of floor space. The building also has a 3 story low rise and is constructed of approximately 8,300,000 pounds of structural steel. The building sits on a 5' thick concrete mat foundation.

The basement was designed to match up with the old J.C.Penney's parking garage levels. The decision to remove the old garage and build the new parking garage was not made until the construction of the building was already underway. It is interesting to note that the new garage does not attach directly to the One Utah Center basement because the new garage is supported off of pile foundations while the building is supported on a mat footing.

The owner wanted the front of the building to have open space at the corner of 200 South and Main Street. Thus, rather than have a square plan, the north-west corner of the building steps back in a saw

tooth configuration. (See photo on front cover.) This saw tooth plan provided sufficient space at the corner entrance but created difficulties getting sufficient moment frames on the two sides of the building where the corner was removed.

The building has special moment resisting space frames as the main lateral resisting system. The frames consist of 36" wide columns with the strong axis in line with the frame. The long east and south sides of the building each have a single moment frame. The shortened sides of the building contain a double frame that form a type of large "tube" frame. The "tube" frame makes up for the shortened length

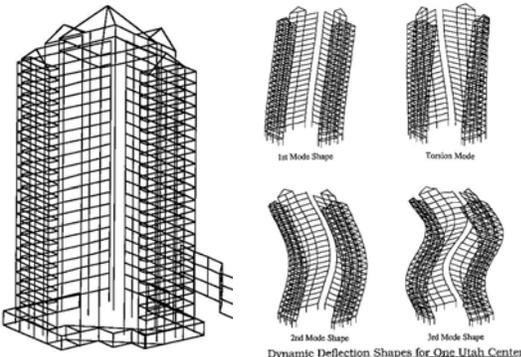


and helps resist torsional effects.

The pyramid roof has a separate frame for the upper stories. The square frame below the pyramid roof is set back at the upper two levels and transfers the seismic forces to the outer frames at levels 22 and 23. The gabled roof and pyramid roof is capable of shedding snow and ice, which is captured with heated concrete trenches so the snow and ice will not drop to the street level.

The floors consist of lightweight concrete deck on composite steel beams. The floor system design included analyzing floor vibrations and the owner has not had complaints of vibration. The floor system has also proven versatile as the space has been renovated over the years. Several tenants have required the floor to be strengthened for file storage, and in at least two cases new stairwells have been added to tie tenant spaces on different floors together.

The One Utah Center functions as one of the anchor buildings on the Block 57/Galivan Center. This building serves a major role in defining downtown Salt Lake City.



MESSAGE FROM THE BOARD (continued from Page 1)

In James Surowiecki's book, "The Wisdom of Crowds" he indicates that in all cases groups are smarter than the smartest people in them. Groups do not need to be dominated by exceptionally intelligent people in order to be smart. Yet despite any of our limitations, when our collective judgments are aggregated in the right way, our collective intelligence is often excellent. Surowiecki demonstrates this collective intelligence can be used to solve a wide variety of problems, no matter how complex they are. Any group problem can be identified by one of three ways: cognition, coordination and cooperation.

Through discussions with many of you, it is my understanding there may be a general disappointment with the profession at large. Money is an easy target, but I am more concerned with the "lack of respect" perception. Each of us deliberately chose this profession, and most of us will stay in it for quite some time. None of us want to be a part of something

that others, or more importantly, we do not respect. When we put down others, we put down ourselves. We compete against each other! We need cooperation.

Our common denominator is our written and un-written code of ethics. Deceit, trickery, overpowering, blocking and exploiting weaknesses are all acceptable moves on the football field. Double-teaming, back screens, picks, fouls and trash talking are commonplace on the basketball court. Bluffing, betting, breaking, misleading and faking are acceptable actions in a casino. None of these are understood to be permitted in the boardroom. There different sets of gaming rules apply. It is when we break the rules that we get penalized 10 yards or shoot free throws. The same should apply in our code of ethics. Any game is better when it is played within the rules. We need coordination.

If we want respect, we have to respect our profession and the requirements and duties that go along with it. Just as James

Surowiecki states; the wisdom potential "within SEAU" is greater than the individuals that make up its membership. We together need to elevate our profession. Together we need to identify that which we will accept and what we will not. Just like working in a large office enables one to become better, our organization with the same mission statement can become very strong. Working alone will never achieve the level of competence which can be achieved by working together. Oxygen and Hydrogen behave explosively when they are apart. Together they are benign water, and most useful.

I would invite each of us to study the ethical side of our profession. Become aware of who you are; who you want to become and what you want the outside world to think. You are how you treat others. "Money often costs too much" Ralph Waldo Emerson.

PRESIDENT'S MESSAGE

How Many Structural Engineers Do You Have In Your Office?

That is a question we are often asked. Do you know the answer? Are you sure? The answer may not be as straight forward as you think.

The State of Utah currently recognizes Structural Engineers (SE), Professional Engineers (PE) and Engineers in Training (EIT). Each is separate with distinct requirements for obtaining that title.

A problem arises when you have an EIT or PE doing structural engineering work. Sometimes they are refereed to as structural engineers – meaning that they are doing structural engineering design work. They are, however, not a licensed structural engineer and should not be referred to using that title.

As an example, consider the following situation: XYZ Engineers has 20 people doing structural design work. It has 5 SEs, 12 PEs and 3 EITs. When asked the question, "How many Structural Engineers do you have?", the correct answer is five. If the question is, "How many

engineers do you have?", then the correct answer is seventeen. If asked, "How many people are working for you who do structural design work?", then the correct answer is twenty. The point is this; XYZ Engineers does not have 20 structural engineers!

Another problematic issue arises with the use of business cards. In my opinion, every business card should have the SE, PE or EIT designation on it. Those designations offer a clear understanding to a layperson about the level of examination and experience that a person has completed. Inner office titles like 'staff engineer' and 'project engineer' are often misleading and should be used with extreme caution because of the ambiguity they create.

Consider the following examples (John Doe is an EIT):

	#1	#2	#3
John Doe	John Doe	John Doe, EIT	John Doe, EIT
Staff Engineer	Staff Engineer	Staff Engineer	

The difference in clarity as to the professional standing of John Doe is prodigious and could be

confusing to a layperson. In the first example John Doe, could be viewed as representing himself as an 'engineer' - when in fact he is not an engineer. The second example more clearly describes John as an EIT, but the subtitle "Staff Engineer" may still create confusion and should be avoided because John is not an 'engineer'. The third example is by far the clearest because it identifies John as an EIT.

These are 'grey' areas that, to the best of my knowledge, haven't been brought before our Professional Licensing Board yet. I'm sure that when they are the lawyers will work out the

specifics details of interpreting the meaning and intent of our Licensing Act. I know that many other states in which these issues have been taken to a Professional Licensing Board for review found that the accused was guilty of Unlawful Conduct and/or Misrepresentation.

Reference: Professional Licensing Act Title 58 Chapter 1-501(1) and Title 58 Chapter 22-501 (Unlawful Conduct)

Barry Arnold, SEAU President

ON ETHICS by DEBORAH LONG

Blaming Others

It's easy to blame moral poverty on other people. Today's headlines give us plenty of moral failures, from government officials to celebrated athletes to famous entertainers. By blaming others, we feel less responsible and less likely to act ethically ourselves. I call this tendency the "Doctrine of Relative Filth." In other words, "I'm not so bad; there are other people out there that are worse." In my profession – real estate – we always point to used car salespeople as ethical illiterates. Attorneys point to real estate agents. Doctors point to attorneys. And so on.

It's easy to point the fingers of blame at others. What is more difficult is accepting responsibility for some of our profession's ills and taking action to remedy those problems.

What can licensees do to take responsibility and create a more ethical workplace and profession? Here are some suggestions:

1. Support tougher standards for obtaining professional licenses and for keeping them. Research on moral reasoning skills indicate that ethical judgment is related to education: that is, individuals who have more years of secondary education perform better on tests of ethical judgment. (Interestingly, education is much more strongly

associated with mature ethical judgment than with chronological age. Getting older doesn't necessarily mean getting more ethical.) Thus efforts to "raise the bar" by requiring more classroom hours in pre- and post-licensing courses may promote more ethical judgment among licensees.

2. Promote the discussion of ethics in professional meetings. Discuss and analyze transactions/events where licensees had problems solving ethical problems. Give this discussion special priority in these meetings by providing them early in the agenda. It's also important to make ethics a topic of conversation at the dinner table at home.

3. Give recognition for civic contributions and de-emphasize promotions and publicity for financial achievement. Discourage the promotion of "top producer" and "million dollar sales clubs" and similar advertisements which emphasize financial success rather than other important individual or team contributions. Too many licensees are encouraged to be successful only in financial terms. This is particularly true in industries where licensees are compensated on a commission basis. The public is often confused about the meaning of terms such as "million dollar clubs" and become cynical about an industry's perceived obsession with income. Insurance

companies have done much to restore the public's perception of them by promoting their contributions to charities such as United Way instead of the number of policies insurance salespeople and their firms sold.

4. Support the implementation of a regional or national ethics helpline and ombudsperson for your industry. Early attempts to implement ethics offices resulted in ethics "hotlines" where callers may have felt that they were turning in colleagues to regulatory agencies. A "helpline" provides callers opportunities to talk to neutral but expert individuals who assist callers in sorting through ethical aspects of their problems and refer them to appropriate resources for additional information. The expert would have no vested interest in the outcome of the problem except to help the individual make a mature ethical decision.

5. Become an ethical mentor and role model. Of all the suggestions here, this one is the toughest. First it requires an acknowledgement that we all have the power to influence others, and equally important, our colleagues, our friends, and our children are all learning from our conduct.

Second, the notion of being a role model forces us to be agents of change. As ethicist Thomas Lickona points out, having ethical will is a critical element in ethical conduct.

Individuals who have this attitude believe that they can make a difference in the world around them. Sadly, many of us believe that what we do and what we say makes no difference at all. The authors of Chicken Soup for the Soul advise us otherwise.

They tell the story of a tourist walking along a starlit beach. The tide is out, and many starfish at the beach's edge are exposed and dying. Coming from the opposite direction, another tourist is walking along the shore's edge, periodically stooping over, picking up a

starfish and flinging it back into the sea. As the two tourists approach each other, the first says, "What are you doing? There must be a million starfish here. You can't throw them all back into the sea. You can't save them all. You can't possibly make a difference."

The second tourist stops, bends over, picks up yet another starfish and throws it into the ocean and says, "Made a difference to that one."

Our ethical conduct may not save the world, nor may it even save a small nation, but our ethical conduct and our

willingness to be an example of moral courage and ethical will to others, may make a profound difference in the people with whom we work. After all, we do not learn our ethics from ethics teachers. We learn our ethics from people who have influence over us.

Deborah H. Long, Pd.D., DREI Continuing Education Programs for Licensed Professionals (919) 968-3742

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BULLETIN BOARD

BULLETIN BOARD SPECIAL FEATURE

This month SEAU would like to feature:

ACI 318-05???

by Jerod Johnson

The release of ACI 318-02 three years ago contained some of the most significant revisions in the concrete code in recent memory. The adoption of the ASCE 7 load combinations in an attempt to provide a "unified" set of load combinations for design was a step the right direction. Of course, this required an adjustment in the ϕ factors used for concrete design to correct the imbalance caused by the slightly lower load factors prescribed by ASCE. This adjustment was readily accepted and easily made by most members of the design industry.

Recently, ACI 318-05 has been released for use by the public at large. This document, as has its predecessors, will be adopted by reference in the forthcoming IBC 2006. So, you may be asking; what are the changes in this latest version of ACI 318? Upon learning the answer you may as well ask; was the production of ACI 318-05 really necessary? Or even; is the three-year code cycle really prudent?

Fundamentally, the revisions in ACI 318-05 do not constitute anything substantive. Throughout the document there are revisions in the code and commentary text. Though some revisions seem trivial, most seem to better or further clarify the design issue at hand. In many cases, equations have changed; or rather, the variables used in equations have changed to provide greater clarity and understanding. For instance many equations in the '02 version of the code reference the f_y value (reinforcement yield strength). In many equations it was unknown whether this was the yield strength of

the flexural reinforcement or the transverse (shear/confining) reinforcement. Fortunately, in most design scenarios the yield strength of the flexural and transverse reinforcement is the same, so it makes no difference. Nevertheless, there are those rare cases where you might be using grade 40 ties or spirals with grade 60 longitudinal bars. Therefore, ACI318-05 has updated the equations accordingly. Wherever an equation specifically requires the yield strength of the confining reinforcement the variable f_{yt} is used in lieu of f_y .

Other provisions changed in ACI 318-05 can be credited to the adoption of the unified load combinations, but did not appear on ACI 318-02. One of these equations, 10-4, prescribes the maximum allowable spacing for reinforcement on the tension surface of beams and one-way slabs. In ACI 318-02 the maximum spacing (s) was defined as:

$$s = \frac{540}{f_s} - 2.5c_c$$

Where f_s (ksi) is the working stress in the bars being designed (which can be taken as $0.60f_y$) and c_c is shortest clear cover dimension for the bars.

Accompanying this equation was also the provision that the s value not exceed $12(36/f_s)$. In the ACI 318-05 this equation has been altered to account for the higher level of working stresses that could result from the load combinations adopted in ACI 318-02. In ACI 318-05 equation 10-4 has become:

$$s = 15 \left(\frac{40,000}{f_s} \right) - 2.5c_c$$

Where f_s is now in psi. This equation has a maximum limit taken as $12(40,000/f_s)$, akin to the $12(36/f_s)$ from the previous version of the code.

BULLETIN BOARD

Accompanying the adoption of the unified design provisions, the ACI 318-02 required changes to the ϕ factors used for reinforced concrete design. Most of the changes in ϕ factors were trivial and easily adapted to the procedures we were familiar with. Perhaps the greatest change in ϕ factor was that for the members classified as 'transitional' based on the level of net tensile strain in the outermost layer of reinforcement. For such members, linear interpolation was required to assess the value for ϕ when the net tensile strain falls between 0.002 and 0.005. For tied members, the ϕ factor for net tensile strains less than 0.002 was 0.65. For net tensile strains greater than 0.005, the ϕ factor is taken as 0.9, and the equation for linear interpolation in tied sections was:

$$\phi = 0.48 + 83\varepsilon_t$$

For ACI 318-05, commentary has altered this equation to:

$$\phi = 0.65 + (\varepsilon_t - 0.002)(250/3)$$

Upon applying a little pencil lead to some scratch paper and re-arranging this equation you will find that it is virtually identical to the previous equation found in ACI 318-02.

In summary, ACI 318-05 does not appear to contain substantive revisions that will greatly complicate or confuse those of us who are intimately familiar with the current ACI 318-02. At the risk of editorializing; it is the opinion of this author that we often become so accustomed to the 'three-year' code cycle that we open up our checkbooks, buy the new code, and start using it without further thought. It appears that ACI 318-05 does not contain a sufficient amount of changed information to merit the release of a new code. Those who mistakenly use ACI 318-02 after the 05 version of the code is adopted are not likely to be in violation of any of the currently adopted code provisions.

THANK YOU

The SEAU Board would like to thank Parry Brown, Jerod Johnson, David Hart and Allen Writz for the informative membership meeting program they presented in February. They did a great job of enlightening us about the structural engineering work being done at the State Capitol. Their program was insightful and awe inspiring. Those that attended were rewarded with a new and rich appreciation for the wonders of our profession. Thank you for a job well done.

SEAU Board

CALL FOR PAPERS

2005 SEAOC ANNUAL CONVENTION

The Structural Engineers Association of California issues this Call for Papers to be presented at its 2005 Annual Convention, to be held at the Loews Coronado in San Diego, California. The dates of the Convention are Wednesday, September 28 through Saturday, October 1.

It is anticipated that the technical program will be composed of papers in the following areas:

Practical Design

Papers of this type will focus on information that can be readily utilized by structural engineers in day to day design. Pertinent topics would include (but not be limited to) the design or retrofit of buildings, bridges, marine structures, tanks, and towers.

Research/New Methods/New Application

These papers will focus on recent research with application to structural engineering, new methods of analysis, and the use of new materials or new applications of traditional materials.

Business

These papers will discuss the business of structural engineering and could address any of the following issues: new markets, liability, fees, human resources, insurance, publicity, or professional services.

Interested parties should fax a brief (300 words or less) abstract of their paper before May 1, 2005 to:

Casey Whitsett
 Technical Program Committee
 2005 SEAOC Convention
 Hope Engineering
 1301 Third Avenue, Suite 300
 San Diego, CA 92101
 Fax: (619) 235-4675

Authors will be notified of acceptance around May 21, 2005 and papers ready for publication will be due on July 1, 2005. Authors will be provided with detailed guidelines for publication.

MARCH SEMINAR – DON'T MISS IT!

You Won't Want to Miss This Opportunity! This month's membership meeting will be held on March 17th. The topic will be "Engineering Ethics". SEAU has gone to great lengths to bring Jimmy Smith, the engineer who literally wrote the book on engineering ethics. This program is one of a kind, and will be very rewarding, interesting and informative for all who attend. Regardless of how smug you feel about your knowledge of ethics, you are guaranteed to come away with a new and enlightened perspective on this important aspect of our profession.

Jimmy wrote the Texas Ethics Exam. If you're unfamiliar with it, the ethical dilemmas (questions) in it are based on common issues an engineer might face from their first job all the way past retirement. The ideas contained in the exam are very thought provoking.

This will be a seminar you will not want to miss! Please mark it on your calendar now and plan on attending. The number of seats is unlimited, but since SEAU is ordering books for everyone who attends (free of charge to members) we need an accurate head count as early as possible. So, sign up soon! We look forward to seeing you there.

SEAU Board

CLASSIFIEDS

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SEAU Presents:

ENGINEERING ETHICS

Presented by:**Jimmy H. Smith, Ph.D., P.E., F.NSPE, F.ASCE****March 17, 2005
University of Utah
EMCB Room 103****5:30 p.m. Social Hour
6:00 p.m. Presentation**

Dr. Smith is an active member of TSPE, NSPE, ASEE, and ASCE. He has served the profession in several capacities, including President, Texas Society of Professional Engineers; President, National Institute for Engineering Ethics; Member, NSPE Board of Ethical Review; and Member and Team Chair, ABET/Engineering Accreditation Commission.

This program is free to SEAU members, but registration is required as SEAU will purchase materials for each attendee. Register by sending an email message that includes your name and intent to attend to seau@seau.org, or a fax with the same information to (801) 453-0762. If you sign up, but don't attend, your materials may be given to someone else.

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