



SEAU NEWS

The Newsletter of the Structural Engineers Association of Utah

Volume IX- Issue I September 2004

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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 Salt Palace Convention Center

The first in a new series of focus articles on important and interesting Utah buildings – see page 3.

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SEPTEMBER EVENT

SEAU FALL SOCIAL

▼
Date:

Friday, September 10, 2004
6:00 p.m.

▼
Location:

6th Floor
Rice-Eccles Stadium

▼
Cost:

\$00.00 for current SEAU members.
(Guests \$30.00)

MESSAGE FROM THE BOARD

“ARE YOU GOING TO MAKE A DIFFERENCE OR A STATEMENT?”



By Barry Arnold,
SEAU President

I have heard the above statement made many different times and in a variety of ways. It is seldom said the same way twice but the meaning and intent is always the same. The world is made up of two groups of people, those who choose to make a

difference (PMD) and those who choose to make a statement (PMS). Whether or not you are going to be a PMD or PMS is a choice you make everyday of your life in a variety of circumstances. We all make PMD-vs-PMS choices regularly in the areas of politics, community, church, family, work, organizations and of course SEAU.

Newspapers are full of examples of both PMD and PMS types of people. The history books typically only tell about the PMD.

As Andy Warhol said, "In the future everyone will be famous for fifteen minutes." He was referring to individuals who chose to be PMS. They get their few minutes of fame then quickly fade from the spotlight into relative obscurity – rarely heard from again on the same topic. They are a "flash-in-the-pan". They
CONTINUED ON PAGE 4

Opinions expressed in the SEAU Newsletter are not necessarily those of the Structural Engineers Association of Utah. Technical information contained herein shall not be used without independent verification by an engineer. Advertising rates and information sent upon request. Acceptance of advertising and informational brochures in the SEAU Newsletter does not constitute endorsement or approval by SEAU of the products or services advertised. SEAU reserves the right to refuse any advertising or editorial comment.

SEAU OFFICERS FOR 2004-2005

SEAU Board Members for the 2004-2005 Year

Office	Board Member	Telephone	FAX
President	Barry Arnold	782-6008	782-4656
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Member of the Board/UEC Delegate Elect	Jake Watson	328-2726	328-2737



Barry Arnold



Julie Ott



Kim Robinson



Don Barfuss



Brent Maxfield



Jake Watson

MEMBER FORUM

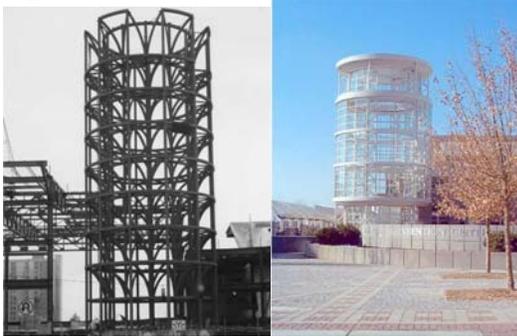
FOCUS

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:

Salt Palace Convention Center

by Rick Seelos

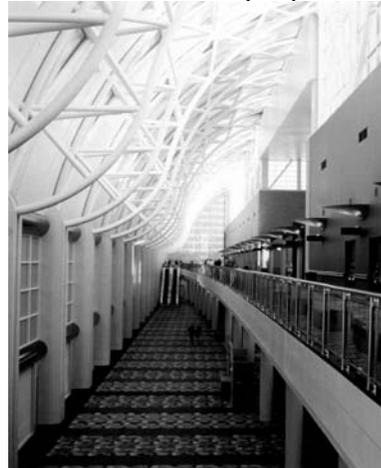
The Salt Palace Convention Center has long been a major part of downtown Salt Lake City. The old Salt Palace facility was home to the Utah Jazz before the Delta Center was built. A 135,000 square foot exhibition hall expansion was added in 1984. While the old facility was torn down in preparation for the 1996 expansion, the 1984 expansion remained and was renovated at that time. Another expansion was added to the south in 2000. Plans are underway to make yet another expansion in the near future.



The anchors of the Salt Palace Convention center are the **entry towers**. The tower at the main entry (located at 1st South and West Temple) is a 110-foot high, 48-foot diameter entry tower. There is a similar but smaller 68-foot high, 38-foot diameter structure at the entry located at 2nd South and West Temple.



Inside the main entry the **main concourse** of the 1996 expansion is supported by trusses made up of circular steel pipe elements. The trusses were created to open the truss to allow light through the truss into the main concourse. The trusses have a triangular cross section and a sloped profile.



The resultant shape resembles a banana and they are thus referred to as “banana” trusses. When the main concourse was extended in the 2000 addition, the triangular cross section and circular steel pipe elements were used but with a straight profile. These trusses were dubbed as “delta” trusses. These trusses are covered with a 15’ wide continuous skylight for the length of the entire concourse to allow the maximum amount of natural light to flow through the structure.



The 46,000 square foot **Grand Ballroom** was expanded 60' to the south during the 2000 expansion. The Grand Ballroom has moveable partitions that allow for multiple smaller groups to utilize the subdivided space simultaneously. The 186-foot long steel trusses were designed to deflect less than 3 inches (L/744) due to full roof snow loading so that the moveable partition walls will operate properly. The south wall consists of 50-foot high, reinforced masonry columns with a masonry wall spanning horizontally between to resist the lateral loads.

The **meeting room** floors, that were part of the 1996 expansion, offer 54,000 square feet of space, which can be divided into as many as 53 areas for groups ranging in size from 3 to 1800 people. The floors were designed to limit vibration. To date, no Human perception of floor vibration has been reported, which is unusual in long span suspended convention center meeting rooms.

The **exhibit hall** consists of 370,000 square feet. As the exhibit hall provides for future expansion to the west, the structure has no restricting lateral force resisting elements located along these walls. Moment resisting steel frames utilizing jumbo-sized steel wide flange columns and long span steel roof trusses resist the lateral forces while allowing for the required large spans between the columns. The steel roof trusses were designed as two span continuous, a 90' span and a 180' span. This resulted in significantly shallower trusses and lighter weight truss members than would have been required with a traditional single span design. These 270 feet long trusses were then spaced at 90' on center and required two 200-ton cranes in a simultaneous lift for erection. The trusses also had stringent deflection criteria as they supported partition walls.

The **exhibit hall floor** constructed in the 2000 expansion is located over a parking garage. The parking garage has a 30'x30' bay. This lays out well under the 90'x90' and 90'x180' bays of the exhibit hall. The slab needed to be designed to support highway loading, as trucks would need to be pulled onto the floor to unload exhibit materials. The fact that the slab was suspended created several design challenges. The first was a need for

a temporary platform that would support the 200 ton capacity mobile cranes that were to erect the exhibit hall roof trusses while at the same time protecting the slab beneath from cracking. This was accomplished using deep (approximately 20") steel tube sections welded together into raft beams that would transfer the load to the column locations.



The suspended exhibit hall floor would not have any finish materials on top of the floor to cover up cracks in the finish concrete surface. Given that the size of the floor is 270'x360' (twice the size of a football field), the floor system had to be designed to limit concrete shrinkage cracks. Special details were designed at the interface with the underground parking garage's exterior walls. These connections kept the floor from being restrained by the perimeter walls by creating slip zones and fixed zones. The slab was also post-tensioned to hold the cracks closed. This combination has greatly limited the cracking due to concrete shortening and has greatly exceeded the owners expectation.

Another element in the design of the floor is that the owner wanted recessed floor boxes with water, electricity, and gas hookups located every 30' on center to feed the exhibit booths. The resulting box was 2'x2' and located in the slab directly over the columns in the parking garage below that were supporting the slab. Designing the supporting beams to slope downward as they approached the column support area solved this problem.

Salt Lake County owns the Salt Palace. In 2003, the Salt Palace booked \$2,500,000 in business and had approximately 650,000 people in attendance to the events. It forms a vital part of Salt Lake City's downtown and economy.

MESSAGE FROM THE BOARD (continued from page 1)

make a big splash but their waves quickly turn to mere ripples in the pond. People don't typically gravitate toward PMS. We do watch and listen to them with curiosity. We give them the courtesy of an occasional slight nod of the head and maybe a non-verbal guttural grunt - indicating in some slight way a limited form of approval.

PMD fill volumes of history books. They typically take courage in their convictions. They walk their talk. PMD are always involved for the long haul. They fight a good clean fight. They are involved, motivated by their convictions that they are doing the right thing for the right reason and not looking for public glory. They let their voices be heard and listen intently to others, always looking for the best solution. PMD are the people we typically gravitate towards. We admire them for their fortitude, courage and commitment to the greater good.

My experience has shown me that PMD are not necessarily those in leadership positions within a group but can be anyone with conviction, a voice box or writing instrument that is willing to take a stand and make improvements.

So, here we are at the beginning of a new year for SEAU and we all have decisions to make. I challenge each of you to become PMD by joining

in and supporting SEAU to your fullest and really make a difference. Join a committee and attend the monthly membership meetings and seminars. Make known your concerns, perceived deficiencies in the system, weaknesses and problem areas that SEAU is not currently covering. Be willing to serve and help close the loopholes, fill the gaps and eliminate problem areas.

I wholeheartedly thank those of you who are already making a difference in SEAU by contributing time and energy to the Board and our many committees or are serving in other capacities/organizations to effect beneficial changes to the engineering profession. It is through your efforts that SEAU runs smoothly and has become the great and influential organization that it is. The engineering profession has been lifted up to new and greater heights because of your efforts and sacrifices.

For all of you who want to be a PMD and are asking yourselves "How do I get involved?", just contact a member of the Board or any committee chairperson that you want to belong to. We/they will take it from there.

Again, thank you all for your support on behalf of the engineering community

ON ETHICS by DEBORAH LONG

What Makes A Business A Profession?

Comic Rodney Dangerfield trademark expression is "I don't get no respect." The same complaint is often uttered, perhaps more grammatically, by many licensed professionals. Real estate agents, surveyors, home inspectors—voice their concerns that the public doesn't treat them with the consideration and deference often afforded other business people. They question why they aren't treated like doctors, teachers, and engineers who fare much better in public polls.

There are certainly plenty of reasons why some businesses are not respected or who are, at the very least, considered "respect-challenged." The annual results of Gallup Polls on honesty and integrity suggest that salaried individuals (nurses,

teachers) are thought of more highly than those who earn commissions and contingency fees (sales people, attorneys). Individuals who have greater formal education (doctors, clergy) tend to be more respected more than those who aren't as well educated (labor union leaders, building contractors.) People who are in the caring professions (pharmacists, funeral directors) do better on these polls than those who are in the business professions (stockbrokers, advertising practitioners).

Many industries work very hard at creating a positive public relations image for their members. Witness the recent efforts by accounting companies to tout their firm's ethics. Notice the securities industry lobbying for stricter disclosure laws. Collectively, real estate agents spend millions of dollars

letting the public know how hard they work. All of these licensed industries try very hard to characterize their businesses as professions.

Actually, any group that can distinguish itself by virtue of a distinct task or tools may call itself a profession. However, the true characteristics of a profession are the ethical conditions of the group, rather than its techniques or tools. While many disagree about the meaning of the term profession, most agree on the following characteristics:

- a clearly defined field of expertise that distinguishes it from others.
- a period of education or training prior to membership.
- a procedure for testing, licensing, and re-licensing generally approved by a

state agency under guidance from the profession itself.

- a dedication to meeting obligations to society and an emphasis on service over income and wealth as a primary motivator.
- a provision for free services for those who cannot afford them.
- the application of a sliding scale of fees according to circumstances or ability to pay.
- a set of self-governing rules that instill a code of ethics regarding relationship among members and toward society.
- a means of self-governance, including the application of penalties for inappropriate behavior or negligence.

It would be difficult to argue that any group – doctors, attorneys, plumbers, teachers – can meet all of these criteria. Nevertheless, it can also be argued that all state-licensed industries provide special services at a high level of skills and expertise as well as meet

many other guidelines that define a professional. What is arguable is whether licensees can self-govern and police their ethical conduct. Let’s face it: if licensees could govern themselves, state legislatures would not have had to create regulatory licensing laws.

This problem of self-governance is ultimately why licensees “get no respect.” The late senator Patrick Moynihan once said in reference to the demands placed on professional that “[they] need to say ‘no’ to requests that will make life worse. Saying no is what makes a profession a profession. That’s how you can tell the difference between a market-driven business and a profession; a profession can say no to things that it knows it shouldn’t do.” Unfortunately, we have had too many examples in recent years, of professionals and corporate and government leaders saying “yes” when they should have said “no.”

Ultimately, being a professional and getting the

respect one deserves is not about compensation or how it’s earned; it’s not about the years of formal education; and it’s not about being in the medical field or on Wall Street. As James Baldwin said, “The price one pays for pursuing any profession, or calling, is an intimate knowledge of its ugly side.” True professionals recognize that every business has its ethical quagmires, that every day can be filled with moral land mines, that the very tasks for which they demonstrate expertise can be done incompetently without bringing much notice or suspicion. It is resisting those temptations and saying ‘no’ to the easy answers that gets the public’s respect.

Deborah H. Long, Ed.D., DREI Continuing Education Programs for Licensed Professionals (919) 968-3742 www.deborahlong.com Copyright © Deborah Long 2003

BULLETIN BOARD

BULLETIN BOARD SPECIAL FEATURE

This month SEAU would like to feature:

MOLD AND MILDEW (M&M) IN CONSTRUCTION

by Jerod Johnson

Liability for mold growth in buildings currently is the most serious environmental concern facing the design and construction industry. Since the mid 90's lawsuits seeking recovery for personal injuries and property damage as a result of M&M have been on the increase and awards in the Millions have been awarded.

So what is this insipid Spore that has caused such fear and consternation? “Mold” is the common term for multicellular fungi that grow as a mat of intertwined microscopic filaments (hyphae). Exposure to molds and other fungi and their spores is unavoidable except when the most stringent of air filtration, isolation, and environmental sanitation measures are observed, (as in hospitals and organ transplant isolation units).

As long as moisture is present, Fungi will reproduce. If a building is dry, mold will not come to life. To stop mold growth, the source of water intrusion must be stopped and existing mold must be cleaned out. Moisture sources could be: open wet building framing systems, new wet building materials, roofing leaks, exterior wall leaks, window flashing, sewage backups, leaking plumbing, slab-on-grade construction, improperly sized air conditioning units, foundation leaks and lack of venting, kitchen and bath ventilation & excessive water use, condensation from improperly installed vapor & air barriers. The most common sources of water intrusion probably are through stucco and other siding, windows, roofing and Synthetic stucco walls. Poured Gyp-Crete on wood substrates is also a problem. The U.S. EPA estimates that about one third to one half of all buildings in the country have areas damp enough to grow mold.

Ambient temperature between 40F and 100F is ideal for mold growth of any cellulose- containing material. New lumber with moisture contents above 12%, Drywall or Gypsum wall board, all types of wood, plastics, adhesives, ceiling tiles, insulation, paint, plywood, paper and cardboard are potential sources of nutrition that spur

mold growth. Wall board (and joint compounds) is an ideal food source for mold, leading to development from a few spores to a colony that can be seen with the naked eye. Black mold growth can often be seen on new lumber delivered to job site. Once mold begins to grow, it does not require much moisture to continue growing.

What can we do in design, code enforcement, and construction to prevent mold development? The fundamental principle of rain and ground water control is to shed water by layering materials in such a way that water is directed downward and out of the building or away from the building. Sealing all the penetrations in a building exterior so they won't leak is almost impossible but must be addressed. At raised floor construction, proper foundation ventilation is a must. Roof leaks are also a major source of water intrusion. Selecting the right roof covering system for the conditions and maintenance is important. Expansion and contraction must be considered, flashing methods, heat build up, roof drainage, and in the case of flat roofs, emergency overflow drain systems.

Some new home builders are now utilizing mold resistant coating in crawl spaces, on wood framing, and on other cellulose based building materials during the construction phase to prevent problems from occurring in the first place.

Buildings built since the adoption of energy saving codes and regulations constitute the majority of mold cases. There have been new materials such as Air Barriers developed to address the energy conservation requirements but no thought was given to what happens when the wall loses its ability to dry. Material suppliers are selling materials for the wrong application, contractors are not reading the installation instructions and performance characteristics nor following the code requirements. Plastic air barriers and "building wraps" entrap moisture and cause condensation to form on the warm side and so you suddenly have free moisture in the wall cavity.

The misapplication of paper-back stucco lath is another cause of water intrusion. Contractors install the lath, staple into place with out furring the wire out the (code required) 1/4 inch and apply plaster. The plaster immediately cracks because it is not reinforced. We find the imprint of the wire on the back of the failed Stucco and the face of the building paper.

Flashing's are to be shingled to drain. Provide enough overlapping to compensate for expansion and contraction. Caulking failures allowing water intrusion are usually adhesion to substrate failures caused by too thick an application of caulking material. Caulking requires proper joint design and backer rod. There has to be a thin area to take the stretching and compression and is a weakened plain to prevent adhesion failure (the joint is only as strong as the adhesion to substrate). There are caulking primers available to enhance the adhesion.

There are ways to remediate M&M infestation. Most require destructive investigation, establishment of an air sampling program, air and surface sampling, cleaning, or removal of contaminated building systems. Cleaning can consist of temperature and humidity control and cleaning surfaces with chemical treatments in a controlled

environment. Wall cavity contamination can be cleaned by sanding framing, nail heads, framing clips, etc. with sanders, scrapers, etc. with built-in vacuums with Hepa-filter systems. High pressure steam or water blasting and abrasive grit blasting are also used for contamination removal. All the above require control of moisture and temperature, establishment of air quality testing programs, remediation programs, and enforcement of the programs as well as secondary waste treatment and disposal.

Programs that do not require destruction and massive clean up include Environmental Cryogenics Technology. ECT uses dry ice particles in a high velocity airflow, under containment, to remove contaminants from surfaces without the added cost of secondary waste treatment and disposal. Another system is high velocity air drying of the structure interior after the new construction has been "closed in" using large, trailer mounted, HVAC units with 3' diameter. Portable duct systems. This method is similar to the windshield defroster system on your car.

Also important in M&M remediation is knowing antimicrobial cleaning agents and how and when to suggest uses. There are a few products that are EPA registered as both disinfectants and sanitizers. These products are ideal for most applications, and are often used for disinfecting non-porous surfaces. Having one product that can be used for many applications lessens or eliminates the risk of choosing the wrong product for a particular application. Bleach has been considered for years as a mold cleaning agent. Most brands of generic bleach are not EPA registered nor designed for disinfecting purposes. Safe alternatives to bleach include antimicrobial chemicals called quaternary ammonium chlorides ("Quats"), are versatile products that are generally less corrosive, do not produce harmful fumes, and are less expensive. When recurring mold is a problem, many contractors have cleaned the damaged areas and then applied a fresh coat of paint. Mold then reappears in about 90 days. True mold resistant coatings are specialized coatings modified with high performance biocides to prevent microbial growth.

Preventing the development of mold starts with project siting. Structures should be located in areas where moisture intrusion can be minimized. The code requirements for drainage away from the structure should be followed. Building design can inadvertently predispose buildings to moisture accumulation including flat areas, slopes the wrong way, etc. and choice of materials that are moisture sensitive. Materials should be compatible with the area climate and installed by trained workers. Contractors must refuse materials that are delivered wet, damaged, moldy or dirty. Establish control during construction of materials, and drying and testing if they do get wet. Include specifications for delivery, storage and handling in your project documents.

Landscaping around the building should not require large amounts of water, should be sloped away from to drain and irrigation systems should spray away from the structure to prevent excess and repeated wetting of the structure.

Proper building maintenance from water control around the building exterior, to HVAC cleaning, maintenance of flashings, roofing, caulking, cleaning tubs, showers, and other damp areas, and air balance is a necessity and can enhance the life of the property.

SEAU COMMITTEES

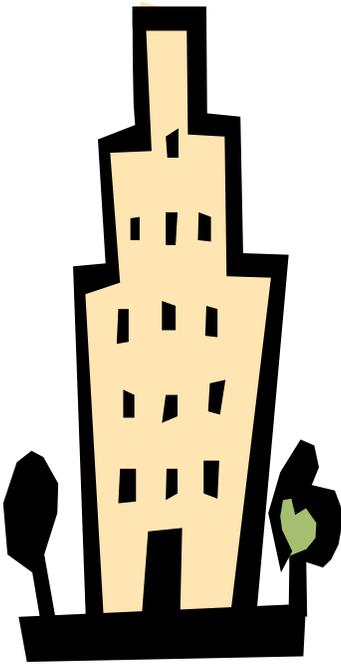
Did you read the *Message from the Board* article on the front page? Looking for a way to make a difference? Contact any of the 2004-05 SEAU Committee Chairpersons listed below and get involved!

Programs	Larry Reavealey (801) 581-6931
Seismic	Ken Willmore (801) 298-1118
Codes	Mark Harris (801) 486-3883
Legislative	David Brown (801) 943-5555
Newsletter	Mike Buehner (801) 486-3883
Technical	Tim Nordstrom (801) 575-8877
By-Laws	Brent Maxfield (801) 240-1529
Professional Practices & Ethics	Jonathan Richards (801) 466-1699
Str. Licensing	Kelly Calder (801) 328-2726
BSSC	Parry Brown (801) 486-3883
UEC Delegate	Brent Maxfield (801) 240-1529
USSC	Barry Welliver (801) 553-0162
Audit	Leon Williams (801) 240-4068
Membership	Jessica Chappell (801) 255-0529
NCSEA	Craig Cartwright (435) 753-2850
PR-Web Page	Jake Watson (801) 328-2726
Emergency Response	Barry Welliver (801) 553-0162
Residential Design (801) 466-1699	Scott Wilson

SEAU MEMBERSHIP APPLICANTS

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

Joshua L. Blazzard	Student
Ken Petersen	Student
Nolan K. Balls	Associate
Jessica S. Chappell	Associate
Andrew Harold	Associate
Matt Lowder	Associate
McKay Monroe Parrish	Associate
Michael R. Tuttle	Associate
Robert Marostica	Professional
Benjamin Nolte	Professional
Jim Wilcox	Professional



ADVANCE NOTICE FOR OCTOBER 2004 MEETING

Basic Design For Stability - Columns and Frames

**October 7, 2004
University of Utah**

AISC and SSRC have teamed up to put together a six-hour program that focuses on the compressive strength of columns and frames and provides a fundamental understanding of buckling. The seminar gives background information needed to understand the stability provisions in the AISC Specification and methods of stability analysis outlined in the AISC Commentary. There will be a strong emphasis on applications through the use of example problems and case studies.

Handouts will be provided to assist you in learning and implementing the information. You may wish to bring your copy of the LRFD Manual for reference. Order forms for the SSRC Guide will be available at the seminar.

Continuing Education Units:

Each participant will receive a certificate from AISC awarding 0.6 CEUs or 6.0 PDHs upon completion of the seminar

Seminar Topics:

- Introduction to Stability
- Column Stability
- Frame Stability-Alignment Chart and Modifications
- Frame Stability-P-Delta Method and Frequently Asked Questions

Presenters:

Joseph A. Yura, Ph.D., holds the Cockrell Family Regents Chair in Engineering at the University of Texas in Austin. His teaching and research there have been in the areas of steel design, stability, structural connections, and offshore structures. Yura has been a contributing member of the SSRC, the Research Council on Structural Connections, and has been a member of the AISC Specification Committee since 1972.

Todd Helwig, Ph.D., is an Associate Professor of Civil Engineering at the University of Houston. His area of concentration for teaching and research are focused on the design and behavior of steel buildings and bridges, with a particular emphasis on the stability and bracing requirements of such structures. He is currently a member of the SSRC Executive Committee, as well as the AISC Task Group on Stability.

Watch for an email announcement for further information on registration and cost for this seminar, or check SEAU's website at www.SEAU.org

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.

SEAU Presents:

FALL SOCIAL

Date: Friday, September 10, 2004

Time: 6:00 – 10:00 p.m.

University of Utah

RICE-ECCLES STADIUM

1400 East 500 South Salt Lake City

Reservations are required (as per previous announcement).

Cost: \$00.00 for current SEAU members who have RSVP and paid by August 23, 2004.
All others: \$30.00

Parking is free in the parking lot just west of the tower. The Olympic Plaza will be open only to SEAU members and guests during our social so those wishing to see the Olympic Cauldron and displays can take a walk through the Plaza at their leisure.

SEAU held its annual golf tournament on Thursday, September 2, 2004, at Bountiful Ridge Golf. Results will be announced at the Fall Social and in the October issue of SEAU NEWS.

STRUCTURAL ENGINEERS ASSOCIATION OF UTAH

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Salt Lake City, Utah 84158-0628

www.seau.org



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