



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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Market Street Restaurant and Oyster Bar, Cottonwood Corporate Center, Salt Lake County, structural design by D. George Hansen, Inc.

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DECEMBER EVENT

There is no General Membership meeting in December.

Look for a fax announcement next month for information regarding January's meeting. In the mean time...

**HAPPY
HOLIDAYS!**



MESSAGE FROM THE BOARD

THE BENEFITS OF SEAU MEMBERSHIP



By Barry Arnold,
SEAU Member of the Board

Without question, our college education was the greatest amount of time any of us have spent dedicated to a specific cause. In addition, it may also have been the greatest financial burden for some of us. Most of us spent at least four years to get an undergraduate degree. Others spent at least five

years or more for a graduate degree.

Who can ever forget the countless hours spent in classes, labs, studying, and late nights cramming for exams? It was an incredible vacuum - sucking in our finances and time. It tested our commitment and dedication to it's very limits. I remember clearly at the start of my sophomore year there were more than forty bright-eyed engineer wannabees seated in the classroom with the latest high powered calculators and green crisp clean calculation note pads - ready to take on the world. By the end of that same year only eight of the original group remained. The others changed majors - looking for something less demanding, less in conflict with the social schedule they preferred to keep. It was no picnic for any of us that is for sure. I once worked a job which required strenuous physical labor nine hours

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MEMBER FORUM

FOCUS

Utah Structural Engineers provide a significant contribution to a wide variety of projects for commercial, government, industrial, and residential clients. Each month, SEAU would like to focus attention on the accomplishments, successes, and hard work of our Utah Structural Engineering firms. This month the focus is on:

Gregersen Structural Engineering, Inc.

Founded in 1999 by Max A. and F. Fontaine Gregersen, Gregersen Structural Engineering, Inc. focuses on structural engineering consulting in the design of structures and foundations for telecommunications, heavy industrial, commercial and residential projects specializing in earthquake, high-wind, cold-regions, forensic and blast/explosion engineering analysis and design.

Past design projects include the structures, foundations and environmental containments for the McKay Dee Hospital Main Electrical Substation in Ogden, Utah, which required a special foundation design to mitigate a high geoseismic liquefaction hazard; forensic investigation of fire damage to the Utah Metals Warehouse in North Salt Lake City, Utah; propane storage facilities for Suburban Propane in Washington state and for the Firestone Company in Salt Lake City, Utah; seismic rehabilitation of the UDOT Shop/Warehouse in Price, Utah; and seismic review of the fire protection piping supports for the Costco discount retail store in Sandy, Utah.

South Pole Modernization Project



The new McMurdo Science Support Center structure was Gregersen's first independent peer review performed for the South Pole Modernization Project. In addition to the structural and constructibility aspects of the project, special attention to environmental consideration (especially thermal and snow/wind related details) was of utmost concern.



An interesting aspect of this structure is the "thermal isolation" splice detail located below the structure's heated first floor steel beams and the lower support column sections that are exposed to the elements. A one-inch thick neoprene pad is sandwiched between two steel base plates to provide a "thermal break" between the heated elevated structural framing and the "frigid" columns extending down to precast concrete spread footings, which in turn are rock-anchored to bedrock at the McMurdo Station..

Cricket Wireless Telecommunications Project

This project included managing all of the Architectural and Engineering Services for over 120 Base Transceiver Stations (BTS) and antenna installations, and the coordination of up to 15 construction crews working on different sites at the same point in time. Locating BTS equipment averaging 12 kips on existing rooftops posed particularly interesting challenges requiring careful consideration of both the location and the footprint of the skid structure to ensure an adequate load path both vertically and laterally within the existing structure.



Max A. Gregersen, P.E., S.E. is president and principal of Gregersen Structural Engineering, Inc. Max is licensed in over 30 states, Alberta Canada, and Puerto Rico. He represents SEAU as a member of the SEAU Engineering and Architecture Standing Committee for the Utah Seismic Safety Commission. He is also a member of ACI Committee 369, Seismic Rehabilitation of Concrete Buildings, ASCE/SEI/ANSI National Standard Committee *Seismic Rehabilitation of Existing Buildings*. Max was a corresponding member of the FEMA/Building Seismic Safety Council 1994 NEHRP structural steel team, and the 1997 NEHRP structural steel and concrete teams for the *Recommended Provisions for the Seismic Design of Buildings and Other Structures* project

UPDATE ON PROPOSED CHANGES TO SEAU BYLAWS**BY-LAWS CHANGE COMING!**

By Brent Maxfield, By-Laws Committee Chair

Are you asleep, apathetic, or too busy to care? Last month we published a significant proposed change to the by-laws. I have not received one comment either for or against the proposed change. Doesn't anyone have an opinion

on this issue? Please read last month's Newsletter and look at the proposed change. The Board of Directors has approved the change. In January, voting grade members will be receiving a ballot to vote on the proposed change. Be prepared to vote on this issue.

**MESSAGE FROM THE BOARD (continued from page 1)**

a day six days a week, but I was just as, if not more, exhausted after a day of classes and studying at college.

After so much effort it is hard for me to understand why so many engineers let their skills slip away. We are fortunate to have a great organization like SEAU that helps us to hone our skills, or as Mr. Covey would say, "Sharpen the Saw." SEAU sponsors or cosponsors most of the seminars which come to the area. SEAU is involved in trying to get the best-of-the-best here to inform and educate us. The organization's intent is to keep us right on top of the latest design and analysis techniques, current products and research, latest industry trends, and good engineering practices. All that is required of us, to benefit from all this information, is to attending a few seminars a year and the monthly SEAU membership meetings. Newland Malmquist, Chairperson for the Programs Committee, (as well as his predecessors) has done an excellent job of bringing some of the best engineering talent to Utah to present new information and educate us. The meetings are very diverse, meeting almost every one's needs and interests. They are well planned and always begin on time. The membership meeting always provides great snacks and a delicious beverage for those of you who feel you might perish if not fed

promptly at 6:00pm. And of course there are continuing education credit certificates offered for those needing them.

It is incomprehensible why many more engineers do not attend these valuable meetings.

Students, would you like a chance to meet your future employer(s)? Chances are they are attending the meetings. They are a great chance to meet people and mingle, do a little networking, and get some name and face recognition. Professors, want to give your students a leg up in the engineering field? Encourage them to join SEAU and attend the meetings. Practicing engineers, do you feel overwhelmed with the volumes of information presented to you in magazines and books to digest and implement? Do you feel a little rusty and outdated? Has a client ever said to you "so-and-so at this-and-thats office does it this way

and they said it is the latest - why are you doing it the old way?" Attend the meetings. The information is presented in an organized intelligible manner which makes the information easy to understand and implement. Employers, does your staff have the latest skills and product know-how? Encourage them to attend the meetings where they will get it.

The value of these educational opportunities is priceless, and considering the sacrifices you have made thus far for your career, is not a burden at all. The meetings and seminars are a minor time demand with huge benefits. They are a "win" for you, a "win" for the engineering profession and a "win" for your clients and the general public.

I look forward to seeing you - at the meetings - real soon.



BULLETIN BOARD**BULLETIN BOARD OLYMPIC FEATURE**

Each month from this issue to the 2002 Winter Games, the SEAU News will be highlighting an Olympic venue, particularly with respect to the structural engineering aspects of the venue. This month's feature is the following:

SALT PALACE CONVENTION CENTER – MEDIA CENTRAL



Though not a venue for any particular event of the 2002 Winter Olympics, the Salt Palace Convention center will serve the important role of media headquarters during the games. Construction efforts began in late August of 2001 to transform the Salt Palace into what will be the equivalent of a small city complete with a bank, dry cleaner, hair salon, general store and an intricate communications system using more than 139 miles of cable to connect 63 news organizations from around the globe.

The Salt Palace has undergone several major phases of renovation and re-construction in recent decades that have transformed it into the premier convention center of the Intermountain West. The most recent expansion to the facility was completed in October 2000 and consists of expansions to the exhibit hall, main concourse, and ballroom in addition to a new 3-level underground parking structure with 600 parking stalls. The two suspended parking levels are 7" thick post-tensioned concrete slabs that required special design considerations and construction phasing to account for creep and shortening. The suspended floor of the expanded exhibit hall consists of a post-tensioned pan joist system capable of supporting highway type loads.

The superstructure consists of 270' long steel trusses lying along primary lines that are supported by built up steel columns, all of which participate in providing support for lateral loads. The design of the long-span trusses enabled the creation of a relatively column free

exhibit space, however, this limited the number of available columns to support gravity and lateral loads thus columns that are present are extremely massive, some weighing in at more than 900 plf. Shorter jack trusses and open web joists are used to bridge the distance between the trusses lying on primary structural lines. The concourse of the Salt Palace is comprised of some of the most interesting, architecturally and structurally unique steel configurations of any structure in the Intermountain West. For aesthetic appeal, structural members such as 'banana' and 'delta' pipe steel trusses in addition to 'tree' columns were incorporated into the concourse design that provide a visually unparalleled framing system that defines a key part of the unique and distinct character of the facility. Structural design for the Salt Palace was provided by Revealey Engineers & Associates.

SEAU MEMBERSHIP APPLICANTS

The following individual has submitted an application for approval by the SEAU membership committee for new members:

James R. Bennett, *Professional*

CORRECTION

In the October 2001 issue of SEAU News, the name of Roberts & Schaefer Company, the subject of that month's focus article, was misspelled in the title and in other places throughout the article. The Editor offers his apology to Roberts & Schaefer Company for the error.



BULLETIN BOARD**MEMBER FEEDBACK**

The focus article on Interstate Brick in the November 2001 edition of SEAU *News* prompted a response from SEAU member George Aposhian concerning the history of the company:

“Interstate Brick was originally located where the Brickyard Mall is now located, near 1100 East and north of 3300 South. One of the old smokestacks is still there. The mall was named after Interstate’s historic beginning place. My grandfather, a new Armenian immigrant from Turkey, worked as a laborer at Interstate after arriving in Utah in 1910.

“The original location was near the place where Interstate mined most of the clay that was used in the manufacture of their brick products. After they removed the clay from the area east of Highland Drive, all the way to 1700 East, in the tract located across the street from the Villa Theater, the housing development known as Mountaire Acres was built. I remember as a child, going to the area to play, especially in the winter, because there were large piles of clay that made great sleigh riding hills, and large puddles of water, which froze to make great ice skating rinks. If one travels along Imperial Street (1700 East) in the area between 2900 South and 3100 South it will be noted that this street runs along the upper edge of an area that is much lower than Imperial Street, with one steep road going down into Mountaire Acres. Unless one knows otherwise, a person might mistake this condition as evidence of a fault, but this is not the case. It is simply the transition into the area where Interstate Brick Company had removed millions of tons of clay from the area.”

INSPIRATIONAL STORY

The following question was part of a physics degree exam at the University of Copenhagen:

“Describe how to determine the height of a skyscraper with a barometer.”

One student replied, “You tie a long piece of string to the neck of the barometer, then lower the barometer from the roof of the skyscraper to the ground. The length of the string plus the length of the barometer will equal the height of the building.”

This answer so infuriated the examiner that he failed the student on the spot. The student appealed on the grounds that his answer was indisputably correct, and the university appointed an independent arbiter to decide the case. The arbiter judged that the answer

was indeed correct, but did not display any noticeable knowledge of physics.

To resolve the problem it was decided to call the student in and allow him six minutes to provide a verbal answer that would show at least a minimal familiarity with the basic principles of physics. For five minutes the student sat in silence, forehead creased in thought. The arbiter reminded him that time was running out, to which the student replied that he had several extremely relevant answers, but couldn’t make up his mind which to use.

On being advised to hurry up, the student replied, “Firstly, you could take the barometer up to the roof of the skyscraper, drop it over the edge, and measure the time it takes to reach the ground. The height of the building can then be worked out from the formula $H=0.5 * t^2$, but bad luck for the barometer.

“Or if the sun is shining you could measure the height of the barometer, then set it on end and measure the length of its shadow. Then you measure the length of the skyscraper’s shadow, and thereafter it is a simple matter of proportional arithmetic to work out the height of the skyscraper.

“But if you wanted to be highly scientific about it, you could tie a short piece of string to the barometer and swing it like a pendulum, first at ground level and then on the roof of the skyscraper. The height is worked out by the difference in the gravitational restoring force $T=2 * \pi * \sqrt{l/g}$.

“Or if the skyscraper has an outside emergency staircase, it would be easier to walk up it and mark off the height of the skyscraper in barometer lengths, then add them up.

“If you merely wanted to be boring and orthodox about it, of course, you could use the barometer to measure the air pressure on the roof of the skyscraper and on the ground, and convert the difference in millibars into feet to give the height of the building. But since we are constantly being exhorted to exercise independence of mind and apply scientific methods, undoubtedly the best way would be to knock on the janitor’s door and say to him, ‘If you can tell me how tall this skyscraper is, I will give you this fine new barometer.’

The student was Niels Borh, the only Dane to win the Nobel Prize for physics.

(Thanks to the SEAW Newsletter for this story.)

HAPPY HOLIDAYS TO EVERYONE INVOLVED IN SEAU !



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