SEAU *NEWS*

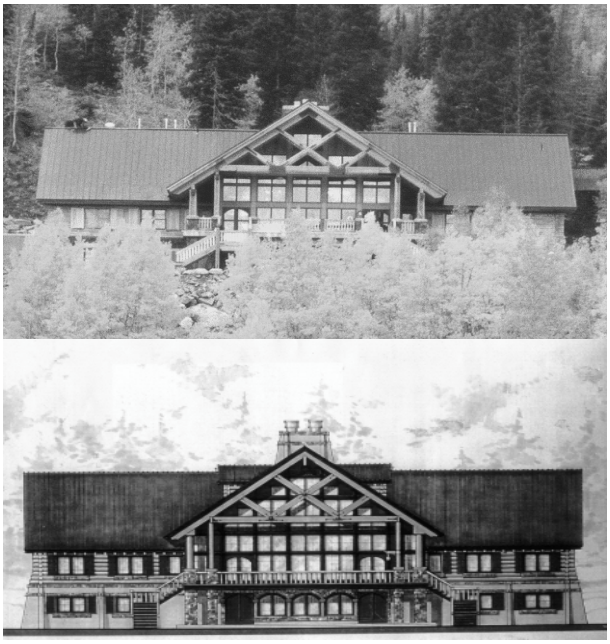
The Newsletter of the Structural Engineers Association of Utah

Volume V- Issue VII May 2001

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.

Articles for publication may be submitted to:
Mike Buehner, Editor
(801) 486-3883
mbuehner@reaveley.com
Advertisements for publication may be submitted to:
Jerod Johnson, Advertising
(801) 486-3883
jjohnson@reaveley.com



Final photo and rendering of Camp Cloud Rim – Girl Scout's Lodge, Summit County, Utah, structural design performed by Richards Consulting Group, Inc.

IN THIS ISSUE

MAY EVENT

Earthquakes, Hazard Maps, and Building Codes: The Ramblings of a Seismologist

Presented by:
Ivan Wong, Seismologist
URS Corporation

Program Date:
Thursday May 17, 2001
5:30 p.m. Social
6:00 p.m. Meeting and Program

Location:
University of Utah
Engineering and Mines Building
Room 104

MESSAGE FROM THE BOARD

GET JAZZED

By Wm. Chris Barker, SEAU
Member of the Board - Historian

It has been a long basketball season. The season seems to have lasted about two and a half years hasn't it? Despite the sarcasm that was intended by that last comment, it has been a lot of fun to watch the ups and the downs of the Utah Jazz throughout this entire basketball season. It has been especially interesting to watch the budding career of rookie player DeShawn Johnson. Lets refresh our memories. DeShawn was one of those hotshot high school basketball players that was able to skip the minor leagues of college basketball and go directly to the professional leagues. He was a dandy high school basketball player too; winning all sorts of honors, accolades and awards. Lets make sure we note that he deserved them all. He was a straight "A" high school basketball player with talent and ability exceeding that of the vast majority of the other high school players. He was fully aware of the many talents that he possessed. The night he was drafted by the Utah Jazz, he managed to get himself into a fistfight with a rival immediately after a basketball game in which he had played (this was not the same as going to a hockey game only to have a game break out). Here was a basketball player with some fire and attitude! The Jazz could use that! Here was a player that was not going to be slapped around. The Jazz could use that! DeShawn wanted to

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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:

Nucor /Vulcraft Group

Nucor is the nations largest producer of open-web steel joists, joist girders, and metal decking. The Vulcraft Group facility located in Brigham City, Utah manufactures steel joists and joist girders for the western United States. The Vulcraft-Utah technical staff, which includes ten licensed professional engineers, works with the Engineer of Record in the design and application of open-web steel joists and joist girders. The steel joists and joist girders are designed for the loading specified by the Engineer of Record and fabricated in accordance with the Standard Specifications of the Steel Joist Institute.

Typical applications for open-web steel joists and joist girders include industrial and commercial floors and roofs. The following projects illustrate the versatility of open web steel joists and joist girders, as well as demonstrate the importance of working with the Engineer of Record to insure the design is per the loading specified.

OQUIRRH PARK OLYMPIC SPEED SKATING OVAL

The use of open-web steel joists in the cable-suspended roof system significantly reduced the amount of steel required versus a conventional steel roof of this size. The roof covers an area approximately 350 feet wide by 650 feet long. Twelve 36 inch deep wide flange girders are each cable-stayed at nine locations spanning the width of the arena, leaving a column free view of speed skating events scheduled for the 2002 Olympic Winter Games. The wide flange girders support light-weight 32 inch deep LH Series open-web steel joists spanning 50 feet.

The cable-suspended roof system required special design considerations by the Engineer of Record, particularly under wind loading. Stability of the structure was addressed in part with a special steel joist bracing system. Vulcraft-Utah provided technical assistance in these functions.

STAN LAUB INDOOR PRACTICE FACILITY

The Stan Laub Indoor Practice Facility at Utah State University is ideal for the cold winters of Cache Valley. The structure is the largest free standing indoor collegiate training facility in the Intermountain West, with a full 100 yard Astro Turf field for year round work outs.

Vulcraft-Utah worked with the Engineer of Record in addressing structural, fabrication, and shipping limitations unique to this project. Open-web scissor truss girders spaced 18 feet on center rise to a ridge height of approximately 80 feet. Concrete buttresses at the exterior of the building resist the thrust forces. The depth of the scissor girder truss at the supporting buttresses is 12 feet and increases to a center line depth of 18 feet. The interior bottom chord clearance accommodates most athletic activities including football.

CLUB REGENT PARK CITY

The Club Regent Hotel in Park City is currently under construction for the 2002 Olympic Winter Games. This project includes five framed floors with 18-inch deep LH Series open-web span steel joists spanning 30 feet. Joists depths have been optimized to provide framing with reduced floor-to-floor height, mechanical system accommodation, and fire rated assembly requirements. Spacing the joists at six feet on center optimized the deflection and vibration characteristics for the design loads. The roof open-web steel joist framing is sloped at 6/12 giving the hotel the desired look for its Park City location.

The Vulcraft Group in Brigham City has nine members of SEAU and is proud to participate in the many outstanding programs and activities SEAU has to offer the membership.

MESSAGE FROM THE BOARD (continued from page 1)

win in the worst possible way. Watch out Michael Jordan, here comes DeShawn Johnson!!

Then, of all the rotten things that could happen to a person, DeShawn graduated to the real world. It seems that he left the little pond as a big fish only to become a little fish in the big pond. DeShawn is now part of the BIG, or BIGGER, league. At this level, it seems like everyone has talent, ability, attitude and more. He did not even know how to choke someone! Talk about unfair! DeShawn has found himself surrounded by players equally as big, strong and fast as himself. He no longer starts in, scores in and ends in every game but rather keeps the bench warm and carries the suitcases of the veteran players to the bus afterwards. He worries now about who is going to block his shots and embarrass him. In one stretch, DeShawn missed 16 straight games because of an injury. He did not play a single second in about 20 other games. How could anyone endure such a drastic change from one year to the next? How could this be! This is tough! This is unfair! Is it too early to consider retirement or too late to consider pursuing a different career? Is it possible that no one warned him that playing professional basketball could be so frustrating?

Lets move on from talking about basketball to talking about us. The author does want to note that he also would have been a professional basketball player like DeShawn except that he was missing one thing – talent/speed/height (you saw that one coming didn't you). Now, compare your own engineering careers to DeShawn's basketball career. In minor league college, all those straight "A's" and compliments from the professors only made you more eager to get graduated, more hungry to get working and more excited to earn money in the big league. You knew you had talent and ability; probably more talent and ability than anyone out there. Who wouldn't want to draft you? You were ready to spit in the world's face, give it a black eye (or choke it) and get some respect. You had new buildings and bridges to design, new codes and recommendations to write, new space age materials and new design methods to experiment with. You were going to kick some butt (okay, some of us were glad to just get a job)! You were going to change the world and show the world just who was boss…… What happened? Did Karl Malone get in your way?

We are in a profession that is tough. There are a thousand and one reasons that it is tough. However, it is still a discipline that is fun to study and is still fun to practice. If it is not….why not? We are in a world that rapidly changes. We need to keep up with it or it will leave us behind on the bench; it will be the one to spit in our faces. DeShawn will need to practice and work hard to just be on the Jazz roster. As engineers, we also need to practice (study) and continually improve our own skills and take advantage of our opportunities in order to "stay in the game." Consistent effort and good attitudes are needed. There is a bright future for all of our league and us. To ensure its success, however, will take the collective effort of all of us. Lets all get excited again! Lets get around to doing some consistent learning, lets get to improving ourselves, lets get to thinking and acting like professionals, lets get to loving our profession. We are not line items in a spreadsheet. Lets get Jazzed!

I have had the opportunity of serving with outstanding people on the board of directors this year. Thank you. I believe that the teamwork of those within SEAU is a crucial element for the continuing success of the structural engineering profession here in Utah. The impression that we are all on the same team, just working in different offices, has been growing on me. We all have similar experiences and challenges. In these big leagues, lets all stick together.!

REPORT ON THE BSSC ANNUAL MEETING

REPORT ON THE BSSC ANNUAL MEETING

By Parry Brown, SEAU Past President

I recently had the opportunity to participate in the Building Seismic Safety Council (BSSC) annual meeting, March 6 through March 8 in Charlotte, North Carolina as the SEAU representative. Some very distinguished engineers presented a lot of information. I will try to report only the highlights of the fourteen pages of notes I took.

The BSSC represents structural engineers from all parts the country and is responsible for developing and maintaining the NEHRP "Provisions" used to formulate future code requirements. The IBC 2000 uses the 1997 NEHRP Provisions pretty much intact. Seismic provisions of the NFPA and ASCE 7

codes are also based on the NEHRP Provisions. Because the structural engineers associations from each state have the authority to propose and vote on all revisions to the "Provisions", the BSSC is an important organization where SEAU can have a real impact on the development of the seismic design provision in our building codes. The 2003 revisions cycle is being organized at this time. Mr. Ron Hamburger will serve as PUC (Provisions Update Committee) chairman. Committees are currently being organized. If anyone is interested please give me a call.

The first day included reports from the eleven technical subcommittees TS-2 through TS1-12 for revisions to the 2000 NEHRP provisions. The revisions to the 2000 NEHRP provisions should make their way into the IBC 2003 code. Technical subcommittee TS-1, Seismic Design Mapping, will be re-activated and TS-13, Non-Building Structures will be added for the 2003 cycle. Some of the revisions from the 2000 cycle that are coming are as follows:

- Revised formulas for determining the empirical building period Ta.
- Revisions to the redundancy formulas.
- Requirements for dynamic site response analysis including soil modeling procedures, selection of time histories, and methods for interpreting results.
- Revised design procedures for reinforced concrete shear walls.
- New design procedures for design of RC diaphragms.
- Proposed elimination of allowable stress design for masonry.
- All masonry bearing walls must be included in the lateral system and designed as shear walls.
- Steel design will follow AISC Seismic supplement no. 2.
- All untested steel moment frame connections must use the enlarged weld access hole per SAC 350. (Currently in dispute from J. Allen Co.'s slotted web connection patent.)
- Adjusted nail penetration requirements for wood diaphragms. (Based on 1.5" penetration rather than 1.625")
- Overturning anchorage of wood shear walls must be increased to account for overstrength of the wall.
- A method for designing perforated wood shear walls will be included.
- The penalty for anchoring equipment and contents using expansion anchors will be reduced or eliminated.
- Guidelines will be included for the seismic design of curtain wall systems.
- Glazing for drift controlled structures must be designed to prevent "fall out" for 1.25 times the expected maximum drift.
- Design provisions for Buckling Restrained Braced Frames, BRBF (Nippon Steel Unbonded Brace System) will be included in the steel section.

Goals for the 2003 PUC that are proposed to be included in future codes are:

- The NEHRP Provisions will be re-formatted to become more of a resource document looking forward to future code requirements and less of a prescriptive code. ASCE 7 will be the code reference that will be based on the NEHRP Provisions.
- The IBC 2003 and future NFPA codes may allow performance-based design in new construction.
- Interstory drift limits may be determined by global building stability and connection rotation capacity.
- Upgrading the seismic requirements affecting large areas of the eastern United States is under consideration due to new geologic information concerning the New Madrid Seismic Zone.

Mr. Art Frankel, USGS, presented new evidence indicating that the magnitude 8 earthquakes that hit the New Madrid Seismic Zone of western Tennessee in 1811 and 1812 were not just flukes. Recent investigations indicate major events occurred at this location in 900 AD and 1500 AD. Current thinking suggests a recurrent interval of 500 years for a major event. Estimates of the maximum considered earthquake range from 7.5 to 8.0. This is a very significant finding and may have a huge effect on the future code requirements dealing with seismic design for a large portion of the eastern United States. Apparently, the eastern U. S. is geologically much older than the west. Because of this, the underlying soils and bedrock are much harder and have a lower attenuation of seismic waves. The seismic forces travel much farther in the eastern U. S. before they lose their strength.

Resistance to any upgrade of seismic requirements in this region has already begun. Mr. Bill Gavin of Reaves Sweeny Marcom, Memphis, TN suggested that the costs required to provide the suggested level of seismic resistance were not justified by the perceived seismic threat. Dr. Seth Stein of Northwestern University, Evanston, IL presented arguments suggesting the magnitude of the past earthquakes were significantly less than the new studies indicate. Mr. Ron Hamburger presented a very convincing argument for upgrading the seismic design requirements based on the results of the 1988 Armenia earthquake which killed an estimated 20,000 people.

UPCOMING EVENTS

MAY MEETING

EARTHQUAKES, HAZARD MAPS, AND BUILDING CODES: THE RAMBLINGS OF A SEISMOLOGIST

Sponsored By:
SEAU

Presented By:
Ivan Wong, Seismologist
URS Corporation

Thursday May 17, 2001
5:30 p.m. Social
6:00 p.m. Meeting and Program

Location:
University of Utah
Engineering and Mines Classroom Building
Room 104

The Salt Lake City metropolitan area is one of the most seismically hazardous urban areas in the interior of the western U.S. because of its location within the Intermountain Seismic Belt and its position adjacent to the seismically active Wasatch fault. In order to help raise the awareness of the general public and to help mitigate earthquake hazards in the Salt Lake City metropolitan area, we have developed a series of earthquake scenario and probabilistic microzonation maps. The nine maps depict surficial ground shaking and thus incorporate the site response effects of unconsolidated sediments. These GIS-based maps display color-contoured ground motion values in terms of peak horizontal acceleration and horizontal spectral accelerations at 0.2 and 1.0 sec periods. The scenario maps are for a moment magnitude (M_W) 7.0 earthquake on the Salt Lake City segment of the Wasatch fault. The probabilistic maps are for the two return periods of building code relevance, 500 and 2,500 years.

In this presentation, Mr. Wong will (1) describe the input that was required to develop these maps and the ground motions displayed on them, (2) compare the maps to current building code maps, and (3) discuss the issues and implications to seismic design associated with our current understanding of seismic hazards in the Salt Lake Valley

2001 STRUCTURES CONGRESS

2001 Structures Congress & Exposition
"A Structural Engineering Odyssey"

Presented By:
The Structural Engineering Institute of the American Society of Civil Engineers presents:

May 21-23, 2001

Location:
Washington Renaissance Hotel
Washington, D.C.

For more information, check
www.asce.org/conferences/structures20001

SEAU NEWSLETTER COMMITTEE UPDATE

REPORT FROM THE NEWSLETTER COMMITTEE

By: Scott M. Adan P.E., Newsletter Committee Chairperson

Another milestone has arrived. The newsletter committee is proud to announce another successful publication year with SEAU. This year, the efforts of committee members Rick Seelos, Mike Buehner, and Jerod Johnson are of particular note. Without the work of these individuals, the level of professionalism seen within this publication could not have been achieved.

Additionally, on behalf of the organization I would like to express appreciation to the members and advertisers who have supported this publication. Thank you for your continued support in the future.

Particular thanks also go to those individuals and firms who have contributed to the monthly focus article. Rick Seelos has championed this popular series. With Rick's help, we have all been able to appraise the many diversified talents of Utah's structural engineers.

I have also been pleased with this years Olympic highlight section. Jerod Johnson has provided an outstanding overview of many of the venues to be showcased during the 2002 winter games.

For the last six years, it has been my privilege to serve in the capacity of SEAU newsletter chairperson. We have seen this newsletter evolve into an acclaimed professional publication.

As in all things, opportunities come and go, chapters begin and end. Come next fall, my wife and I will be starting a new chapter in our lives in a new location, Seattle Washington.

Unfortunately, I cannot live in Seattle and remain newsletter chairperson. However, I am proud to announce that Mike Buehner will now be serving as the next newsletter chairperson.

Previously, Mike had been serving on the committee as the director for advertising. Mike will be stepping up as the new newsletter chairperson this fall.

Jerod Johnson has volunteered to serve as the new director for advertising. Please feel free to contact Jerod if you or your organization is interested in advertising in the newsletter.

Looking to the future, I believe the newsletter is on course to continue its mission, providing a voice for Utah's structural engineers. Please make a commitment now to increase your level of participation in the upcoming SEAU year.

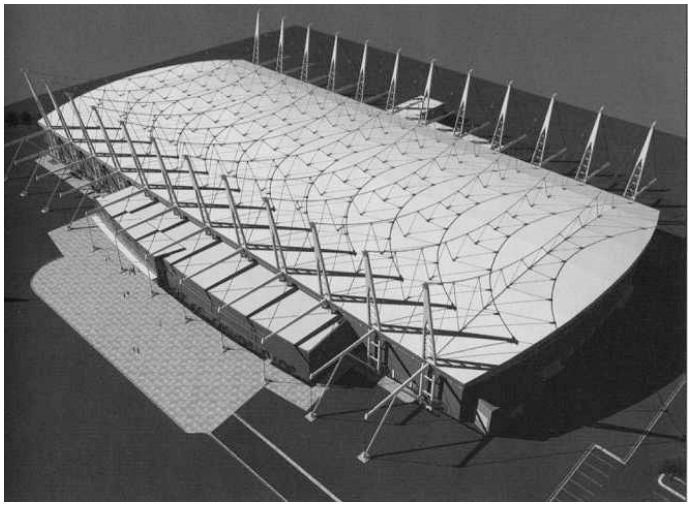
It has been my pleasure to serve as the editor and to be associated with such an outstanding group of professionals. I will fondly remember the experiences and relationships forged within the organization.

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:

Oquirrh Park Speed Skating Oval, Kearns City



The Oquirrh Park Speed Skating Oval is covered by a cable suspended roof system. Girders for the roof consist of W36 sections curved to match the roof profile. Angled cable hangers connect to each girder along their length thus providing support and enabling the girders to reach the massive 310-foot span. This design enabled a low roof profile and decreased interior volume, which helps maintain desired temperatures for what is hoped to be the world's fastest ice. Masts along the perimeter support the cable suspended structure and are counterbalanced by massive concrete anchors.

The interior slab on grade is 7" thick and extremely smooth with no joints, one of the requirements for the superior surface requirements for the ice sheet. Additional measures were taken during design and construction to prevent excess and differential settlements that could also effect the life serviceability performance of the slab.

The Oquirrh Park Speed Skating Oval will be in the world spotlight during the 2002 Olympics as it will serve as the venue for speed skating events.

SEAU MEMBERSHIP APPLICANTS

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

1. Mitch Mortensen, *Associate*
2. John Charchenko, *Associate*
3. David Platt, *Student*

THIS SPACE FOR RENT

The newsletter can be an excellent forum to advertise and target a very select group of professionals. To find out more contact:

Jerod Johnson, c/o Reaveley Engineers & Associates, Inc., 1515 South 1100 East, SLC, UT 84105, Phone 486-3883, Fax 485-0911
Email: jjohnson@reaveley.com

IBC 2000 CODES AVAILABLE

SEAU has 11 copies of the IBC 2000 code available at a special discount price of $55. To take advantage of the special price, call Steve Cohn @ (801) 328-0278. Hurry and call now.

SEAU WEB SITE REDESIGNED

After much anticipation, the redesigned SEAU Web site is live and on the Net. The site features an updated graphic look, as well as a new organization that should make the site easier to navigate. Log on and check it out at www.seau.org!

Among other goals, we would like the Web site to provide a conduit for information on the activities of the Association. The Board and Committees page, in the For Members area of the site, contains links to pages for most of the committees. Committee members and chairs are especially encouraged to check their committee page and offer any suggestions or corrections.

The Web site committee welcomes any suggestions for new ways to use the site to communicate with members of the Association and the general public. If you are interested in becoming a member of the committee, we can always use a fresh perspective. Let a member of the committee know your ideas, questions, or corrections:

Barry Welliver, wellive@attglobal.net
Jake Watson, jake@ckengineers.com
Dave Cassett, dcassett@reaveley.com

SEAU HAS MOVED!

SEAU has a new address, and now has a phone number:

SEAU
P.O. Box 742
Centerville, Utah 84014-0742
Phone: (801) 321-0259

When you call, either Peggy Ogzewalla or Danelle Washburn will answer. Peggy is now the executive Director for SEAU.

Please make a note of our new address, and get it changed in your records. Also, just a reminder that our web site is seau.org – check it out.

CLASSIFIEDS

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SEAU Presents:

EARTHQUAKES, HAZARD MAPS, AND BUILDING CODES: THE RAMBLINGS OF A SEISMOLOGIST

Presented By:
Ivan Wong, Seismologist, URS Corporation

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Thursday May 17, 2001
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Location:
University of Utah
Engineering and Mines Classroom Building
Room 104

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STRUCTURAL ENGINEERS ASSOCIATION OF UTAH

P.O. Box 58628
Salt Lake City, Utah 84158-0628

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