



SEAU NEWS

The Newsletter of the Structural Engineers Association of Utah

Volume VI- Issue III November 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.

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South Pole Rebuild - Independent structural and cold-regions engineering peer review performed by Gregersen Structural Engineering, Incorporated, Park City, Utah. (Photo courtesy of Raytheon Polar Services and The Arctic Sun)

IN THIS ISSUE

Message From The Board p 1

Member Forum..... p 2

NCSEA Report..... p 3

Proposed By-Law Changes ... p 4

Bulletin Board p 7

NOVEMBER EVENT

Engineer's Role In Emergency Response

&

Full Scale Wood Shear Wall Dynamic Test Results

Presented by:

Ross Hansen, P.E.,

Mel Mcquarrie, P.E.

Joe Crilly, P.E.

Program Date:

Thursday, November 15, 2001

5:30 p.m. Social Hour

6:00 p.m. Program

Location:

University of Utah

EMCB Room 104

MESSAGE FROM THE BOARD

EMERGENCY RESPONSE PLANNING



By Julie Ott,
SEAU Member of the Board

This spring I had the opportunity to spend several weeks in our Seattle office after the Nisqually earthquake. My time in Seattle was spent doing building walk-through evaluations, reports, URM building crack mapping, and repair documents.

In touring through the damage zones several things became very apparent to me. The most alarming to me was the huge differences in repair / damage assessment techniques that

were employed by different engineers / offices. The other is the preparedness of some offices versus the lack of preparedness of other offices.

On several occasions I spoke with building owners who were after the 'second opinion.' The owners had had an engineer do a building evaluation, saw what other repair or lack of repair work was being done on adjacent buildings, become uneasy at the extent or lack of repair work being done on their building, and want another opinion.

With this experience and the recent New York events this makes me wonder how we, the member firms of SEAU, will handle an emergency situation.

- Do we know how to properly assess building damage for green, yellow, and red tagging? Several

CONTINUED ON PAGE 6

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:

**Interstate Brick
a Division of Pacific Coast
Building Products**

Interstate Brick, located in West Jordan was started in 1891 and originally located on West 53rd South in Murray. Throughout the years, Interstate has moved to the forefront of brick production by dedicating its facility to the manufacture of large veneer brick and 16- inch long structural brick. It ships its product all over the United States and is supported by two licensed professional engineers.

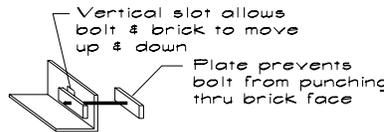
The three following projects are examples of Interstate’s Atlas structural brick used as non-load bearing curtain walls.

Crittendon Court Apartments

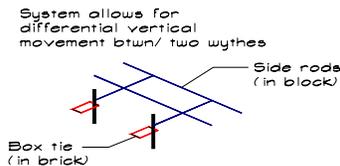


Built in Cleveland, Ohio, the 17-story load-bearing building was built without the use of scaffolding. Because of the

differential movement in such a tall structure, the structural engineer employed the use of a two-wythe masonry wall system. The inner wall (i.e., the load-bearing wall) was built with concrete block, which supports a precast concrete plank floor system. Architecturally, this was not an issue because the interiors were finished out with drywall and furring. Each floor (floor and respective wall) is stacked on top of each other for the entire height of the building. The supporting CMU end walls were clad with Interstate’s 4-inch Atlas brick. Both wythe’s of masonry were directly supported by the foundation footings (i.e., no shelf angles were used for the brick curtain wall). For the non-load bearing sidewalls, 6-inch wide Atlas was used, again directly supported by foundation footings.



Critical to the whole design, were the connection details that tied both the CMU and structural brick together, which allowed for differential vertical movement (between the two walls) while providing for horizontal restraint in both parallel and perpendicular directions to the wall.



Brigham Street Apartments



Located near downtown Salt Lake City, the complex is a series of 8-story buildings overlying 2-story parking structures. The former is built with a post-tensioned concrete floor/ cast-in-place concrete framing system and cladded by Interstate’s structural brick. The parking structures were built entirely out of cast-in-place concrete. Though the brick panels are a non-structural wall cladding system, they can influence the overall building rigidity, especially when tied to a post-tensioned floor/concrete shear wall system. The key is in the connections, allowing for unrestrained movement where needed (i.e., preventing “horizontal rotation” of the building).

**The Vontz Center for
Molecular Studies, University
of Cincinnati**

Designed by nationally known architect, Frank O. Gehry, the facility houses research laboratories, offices, and academic spaces for molecular studies. The building involves the use of brick panels with 21 individual curtain wall openings, with some panels as high as 29 feet high. There were 375 curved brick panels used, each different from the other which curve both horizontally and vertically. It took 36 bricklayers seven months to lay up the panels, all done without the use of forms. The panels were built in a factory some 210 miles away and

trucked to the building site for erection. "Gehry said he would have preferred to clad the Vontz Center in metal...but chose brick because of budget limitations".



NCSEA CONVENTION REPORT

Annual report of the 2001 NCSEA Convention

By Craig Cartwright

Every year at this time I feel particularly honored to represent SEAU at the NCSEA annual convention. As the SEAU delegate to NCSEA, I have had the privilege of standing before the delegates from 31 other states for the past five years and represent SEAU.

This year the annual convention was held in Manchester New Hampshire. Our president, James Williams, has already reported on the two keynote speeches by WTC engineer Leslie Robertson so I will not repeat that part of the program except to say it was most excellent. The annual convention generally consists of three sessions excluding all the fluff in between like exhibits, banquets, receptions, awards and the like. The local host organization (New Hampshire) was responsible for the technical presentation sessions. The presentations are usually on local topics such as "Developing Snow Load Criteria for New Hampshire". The other two sessions include committee and business meetings. These are the topics I wish to discuss in this article.

Delegates are encouraged to participate on the many committee activities. There are ten committees. Four are organized for in-house activities such as Bylaws and Membership. The other six are to improve the profession. These six committees

include Advocacy, Continuing Education, Code Advisory, Professional Certification, Publication, and Licensing. As the SEAU Delegate, I serve as Chair of the Publication committee. Our job primarily consists of controlling the editorial content of STRUCTURE magazine. By the way, if any of you are not receiving STRUCTURE please contact me or our secretary Chris Barker. It means you are not on the SEAU mailing list. Since STRUCTURE is now published ten times per year, my committee is kept very busy but the work is quite rewarding. I hope you like the book. Please take advantage of the full opportunity that STRUCTURE has to offer. Remember, STRUCTURE is quite literally your magazine since it is owned by NCSEA and NCSEA is "owned" by the individual state member organizations that, in turn, are comprised of you. You have a voice in how the magazine reports and presents structural engineering activity. Submit articles, letters to the editor, or just contact me if you have any ideas for articles you would like to see in future issues.

Two other committees have been particularly active lately. They are the Code Advisory and Professional Certification committees. The Code Advisory committee has been heavily involved for many years with the IBC code development. Much of that effort is now over except for maintenance. But now, the NFPA code development is in

full process and is occupying a considerable amount of effort. This committee has been instrumental in representing the concerns of structural engineers as these codes are developed.

The Professional Certification committee is tackling a monumental task of forming a consensus among structural engineers as to what skill and knowledge is necessary to obtain certification, at various levels, as a structural engineer. Once a consensus is reached, the next step is to actually organize a national sanctioning body to certify structural engineers. Understand this is not an effort to replace state licensing or provide national licensing. Rather, it is an effort to voluntarily rank structural engineers according to their level of skill in the structural engineering arts. This ranking, and subsequent certification, would be used by clients, employers, or even state licensing boards, to supplement their selection criteria. Think of it as tantamount to the attorneys' Bar Association or Board Certification in the medical profession. Utah's DOPL has a Structural Engineer title act that does about the same thing. The effort by NCSEA is to provide similar certification but it would be nationwide and uniform. However, it would still be a "title" certification rather than a "practice" certification. The committee effort is progressing quite well but is expected to take several years. The biggest problem now is the definition of

skills necessary to classify in the various levels of proficiency.

Finally, the NCSEA annual convention concluded with the member organization (MO) business meetings. Each year proposals are presented by state MO's to the NCSEA membership for approval. If approved, they become resolutions, opinions, etc., that make up the position of NCSEA to the nation in matters concerning the structural engineering profession. This year two resolutions were presented to the MO's. First was a proposal by the Boston Area Structural Engineers (BASE) to put construction quality control

responsibility under the direction of the structural engineer of record (SER) rather than the local building official. The IBC and its predecessors require quality control to be under the direction of the local building official. The current draft version of the proposed NFPA code requires the SER to direct the quality control program. The BASE proposal passed and now resolves that the SER should direct the construction quality control program.

The second proposal, by the NCSEA MO Development committee, was to encourage individual state MO's to communicate regionally on

common interests in order to form a regional consensus that would eventually lead to a national consensus. This proposal was somewhat vague and confusing and did not pass.

Articles concerning national certification, code development, quality control testing responsibility, and other useful information can be found in past and future issues of STRUCTURE magazine. Issues containing these key topics are usually posted on the NCSEA website at www.ncesa.com or can be obtained by contacting me, your official SEAU delegate.

PROPOSED CHANGES TO SEAU BY-LAWS

Proposed By-Laws Changes

by Brent Maxfield, By-Laws Committee Chair

The Board of Directors has asked the By-Laws Committee to propose a by-laws change. The essence of the change is this: The nominating committee will submit only one name for each office instead of two names.

This issue was addressed in the January and March 2001 issues of SEAU News. Please review the proposed change carefully. If you have suggestions to make it better, please let me know. If you do not like the changes, also let me know. We will publish your comments in the December SEAU News. I feel that both sides of the issue should be discussed openly.

The schedule for this change is as follows:

November 2001: Publish proposed changes in the SEAU News, and receive comments from membership.

December 2001: Publish comments and revised proposal based on comments received in November. Board of Directors will approve final proposal.

January 2002: Send out final ballots to voting grade members

If the proposal passes, changes will begin for the May 2002 election.

Please e-mail your comments to me at maxfieldba@ldschurch.org

**ARTICLE IV
OFFICERS & ELECTED OFFICIALS**

Section 1. The officers shall be President, President Elect/Vice President, and a Secretary/Treasurer.

Section 2. The Board of Directors shall consist of 7 voting grade members which shall include the three (3) officers, and four (4) directors. One of the directors shall be the last available Past President.

Section 3. The President Elect/Vice President and 2 Directors shall be elected annually by the voting grade members.

Section 4. The President Elect/Vice President shall be elected for a three year term: one-year to serve as President Elect/Vice President, then serve the following year as President, and serve the final year as a member of the Board of Directors as the Past President.

Section 5. The two (2) Directors elected annually shall be elected for terms of 2 years. One of the two (2) Directors shall be elected as Secretary/Treasurer designate and shall assume that office the second year of service. The first year of service shall be as the Association historian. The other elected Director in the second year of service shall be appointed as the Association representative to the Utah Engineers Council.

Section 6. Directors shall be ineligible to succeed themselves, ~~except as noted in Section 7a below.~~

Section 7. Vacancies in the Board of Directors shall be filled as follows:

- a. Vacancy of a Board member in their first year of service: ~~The Board of Directors shall fill the remaining fiscal year position by appointing the candidate receiving next highest votes during the last election, who ran for the position being vacated. If this individual is not available, the Board of Directors shall appoint a voting grade member to fill the remaining fiscal year term. This appointed individual shall be eligible to run for the same position during the next election.~~
- b. Vacancy of a Board member in their second year of service: The Board member designated to fill the vacated position the following fiscal-year, shall be appointed by the Board of Directors to fill the vacated position (i.e.: Vice President replaces vacated President, Historian replaces vacated Secretary). This individual will continue to serve the following fiscal year in the same position. The then vacated first-year position shall be filled per the above paragraph.
- c. Vacancy of a Past President: The most recently available past president shall be appointed by the Board of Directors to fill the remaining fiscal-year position of Past President.

Section 8. One voting grade member shall be elected as a representative to the Utah Seismic Safety Council. This representative shall be elected by the voting grade members for a term of two (2) years. The Utah Seismic Safety Council Representative may not hold any other current elected office within the Association. If this position is vacated, the Board of Directors shall appoint a voting grade member to fill the unexpired term of service.

ARTICLE V

NOMINATIONS AND ELECTIONS OF OFFICERS & REPRESENTATIVES

Section 1. The election of the President Elect/Vice President and two (2) Directors shall be conducted by ballot prior to the Annual Business Meeting of the Association in the Month of May, as described in Section 3 below. The election of the Utah Seismic Safety Council Representative shall be held bi-annually in conjunction with the annual election.

Section 2. Candidates for the offices of President Elect/Vice President, Director, and Utah Seismic Safety Council Representative shall be nominated and elected in accordance with the following procedure:

- a. A nominating committee consisting of five (5) voting grade members shall be nominated and

elected by paper ballot at the March meeting. ~~Nominations for this committee may be made by members of any grade, but only voting grade members shall be nominated. shall be made as indicated in subsection b below.~~ Incumbent Officers, Directors and members of the Nominating Committee for the previous year are ineligible for the current Nominating Committee except as follows: The President Elect/Vice President shall be chairperson of the Committee and one incumbent Director may be elected a member of the Nominating Committee.

- b. Only voting grade members shall be nominated to the Nominating Committee. Prior to March 1, the Board of Directors shall select 8 nominees for the Nominating Committee. In addition to the nominees selected by the Board of Directors, members of any grade may also submit, to the President Elect/Vice President, nominees for the Nominating Committee. These names must also be submitted prior to March 1.
- c. Prior to the March meeting, the names of the nominees for the Nominating committee shall be sent to the members informing the membership of the intent to elect a Nominating Committee at the March meeting. The date, time, and location of the March meeting shall also be given.
- d. At the March meeting, additional nominees for the nominating committee may also be made. Voting grade members shall vote by paper ballot for four (4) from at least eight (8) nominees. The four (4) receiving the highest votes shall be declared elected to the Nominating Committee. Service on this Committee shall not affect a voting grade member's eligibility for office.
- e. Before April 2, the Nominating Committee shall report its nominations for office - ~~at least two (2) names~~ one name for President Elect/Vice President and ~~at least two (2) names~~ one name for each Director and Utah Seismic Safety Council Representative to be elected. This report shall be sent to the members before April 9.
- f. Up to the April general membership meeting, additional nominations may be made by petition to the President Elect/Vice President of at least 5% of the voting grade members.

Section 3. Before May 1, all voting grade members shall be mailed a ballot listing the nominees for the various offices along with a plain envelope and an outer envelope stamped "Ballot". The marked ballot shall be sealed in the plain envelope, enclosed in the outer pre-addressed envelope, which shall be signed by the voter, and mailed, to be received in the Association

office before noon of the day of the Annual Business Meeting in May. The ballots shall then be counted and those nominees receiving the highest votes shall be declared elected at the Annual Business Meeting. In case of a tie, the President Elect/Vice President shall cast an additional and deciding vote.



MESSAGE FROM THE BOARD (continued from page 1)

- years ago FEMA did a seminar in Salt Lake on this process, how many of us remember what to do, or where the manual is?
- Do we have the proper FEMA documents on assessing URM, concrete, wood, masonry, and steel, etc., buildings?
- Should we (SEAU firm members) not have an agreed upon set of repair methods – FEMA documents perhaps?
- If downtown is severely damaged do those of us with offices downtown have an offsite pre-agreed upon meeting place?
- Do we have phone numbers easily accessible of home, work, city, county, state, clients, SEAU, other offices that are readily accessible?

This list can go on indefinitely.

I was provided a very good example of a preparedness plan set up in our Seattle office. When the earthquake hit there the employees only had to grab their handbooks and go step-by-step through them to take care of first personal, then office, and then community.

I am proposing that SEAU develop an emergency response plan. A printed document that is a prescribed set of basic steps that shall be taken in an emergency. This would include the basic minimum guideline

for damage assessment and repair that would be followed by all members. I feel very strongly that uniformity between our member firms will increase assessment and repair times. Most importantly the speed and uniformity of our actions will provide a greater confidence in the community while trying to restore our cities to a fully functional state.

Below is a very limited outline of items I feel should be included in a booklet. Your comments and suggestions would be appreciated.

SEAU Emergency Response

TEAM ASSEMBLY – Contact, Communication, Assembly

1. Check on family first
2. Contact office, if phones are out go to office, if office is in damage area meet at prearranged site.

TASK LIST FOR CLIENT TEAMS

1. Walkthrough
2. Reporting
3. Site Engineering
4. Pre-Printed Post-Earthquake Client Survey Form
5. Pre-Printed Posting Notices – Standard Phrasing

RESEARCH TASK LIST

1. Procedures for collecting immediately available data for future research

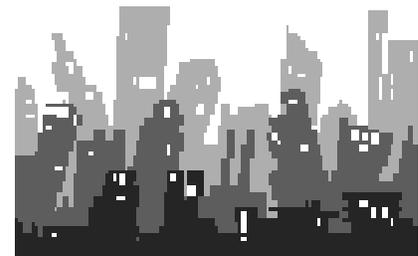
2. Contact numbers for FEMA, federal, state, etc. affiliations that will be sending response teams to emergency sites.

FIELDWORK GUIDLINES AND SAFETY TIPS

1. Goodwill advice
2. General Building Evaluation Criteria
3. Evaluation of High-Rise
4. Safety Tips for Post-Earthquake Field Work
5. Recognition of Hazardous Materials
6. Research Reconnaissance
7. Administrative Procedures in the Field
8. Emergency Supplies

QUICK LOOK REPORT AND PHOTOGRAPHY PROCDEURES

1. Template letters, reports, postings
2. Outline information gathering guidelines
3. Photos documentation tips from previous emergency situations



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:

PEAKS ARENA



Photo by Paul Richer, Richer Images, courtesy of VCBO Architecture, L.L.C.

The Peaks Arena at Seven Peaks Resort in Provo, UT is a 114,000 square foot building featuring two ice sheets, a concessions area, and administrative offices. The arena is scheduled to host men's and women's hockey during the 2002 Winter Olympics. An outstanding structural feature is the north arena roof that consists of pre-manufactured joists supported by custom designed and fabricated girder trusses spanning 208 feet.

Due to the large size of the girder truss members,



extensive coordination was required between the structural design team, fabricator, and contractor. In order to control costs the girder trusses were designed using conventional rolled steel shapes for the chord and web members. For time savings and ease of erection the trusses were designed as shop fabricated modular segments that were bolted together at the site. At the height of construction, one girder truss was erected every five days. The speed of erection was limited only by the speed at which the pre-manufactured roof



joists and deck could be assembled after raising each girder truss into place. The Peaks Arena was designed by VCBO Architects and ARW Engineers. The world spotlight will be on the Peaks Arena during the 2002 Olympics when it will be used as a venue for ice hockey.

CLASSIFIEDS

STRUCTURAL ENGINEER

C. A. Cartwright Engineers has an immediate opening for a senior level building structural engineer in our Salt Lake metro office. Successful applicant must possess significant design/analysis skill as well as business management and development skills. Must be licensed. SE preferred. Send resume to:

Personnel Manager
 215 North Redwood Road
 North Salt Lake, Utah 84054
 801-936-1465 (fax)
 801-936-1515 (voice)
 job@caceng.com



ASST. SALES / ESTIMATING MNGR.

Wanted, Structural Engineer for Architectural Sales (Curtainwall) and estimating. 10-years construction sales/engineering experience. Strong presentation and closing skills. Comp salary & benefits, bonus and PS. Apply to:

Steel Encounters
 525 E. 300 So. Salt Lake City, UT 84102
 Tel 801/322-4701 Fax 801/322-4729
 email steel3@xmission.com

In the November General Membership Meeting, SEAU Presents Two Sperate Topics:

OUR EXPERIENCES AND PHOTOS FROM GROUND ZERO – THE ENGINEERS ROLE IN THE EMERGENCY RESPONSE TASK FORCE

Presentation by:

Ross Hansen, P.E. and Mel Mcquarrie, P.E.
FEMA Urban Search & Rescue Team Utah Task Force 1

HOW TO OVERCOME PROBLEMS DUE TO HOLD DOWN ECCENTRICITIES IN PLYWOOD SHEARWALL SYSTEMS

Presentation by:

Joe Crilly, P.E.

Important new findings from full scale dynamic testing of staple-fastened plywood shearwall systems with a focus on eccentric and secondary moments from hold downs at jam columns.



Thursday, November 15, 2001

5:30 p.m. Social Hour

6:00 p.m. Meeting and Presentation



Location:

University of Utah
Engineering & Mines Classroom Building
Room 104

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Board of Directors

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Barry Arnold, *Member of the Board/Historian*

Julie Ott, *Member of the Board/UEC Delegate Elect*