



SEAU NEWS

The Newsletter of the Structural Engineers Association of Utah

Volume VI- Issue II October 2001

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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 Vontz Center for Molecular Studies, University of Cincinnati
Brick supplied by Interstate Brick Co.*



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OCTOBER EVENT

Bennett Building Seismic Retrofit

▼
Presented by:

Ian Aiken, Parry Brown, Jeff Jafarzadeh, Marty Kemsley, Domingo Moran

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Program Date:

Thursday, October 18, 2001
5:30 p.m. Social Hour
6:00 p.m. Program

▼
Location:

University of Utah
EMCB Room 104

MESSAGE FROM THE BOARD

WTC A STRUCTURAL SUCCESS



By James M. Williams,
SEAU President

On October 5, 2001 only three weeks since the tragedy of September 11, I attended the National Council of Structural Engineers Associations 9th Annual Conference. The Keynote Address was to be presented by Leslie Robertson, the structural engineer responsible for the design of the World Trade Center (WTC). His topic was to be "The Design Concept for a 500-Meter Building." The Keynote Address topic was

changed to, "The Design, Construction and Collapse of the World Trade Center." Needless to say, the presentation was a very emotional one. (Leslie Robertson did present the other topic later in the conference).

As many of you remember, Leslie was a guest of SEAU several years ago and presented a wonderful and captivating presentation, part of which did address the construction of the WTC. We are all aware of the 110 story height, the 209' x 209' floor plate of each tower, the 60' long open web joists, the 3'-3" perimeter column spacing, and the 48" deep plate girders, etc...

Following are some other interesting facts you may not know.

Prior to engineering the WTC, the tallest building Leslie Robertson had engineered was 20 stories. (Maybe there is still hope for me).

CONTINUED ON PAGE 3

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:

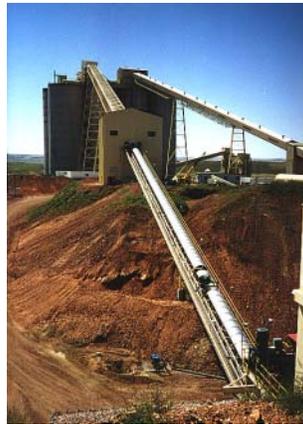
Roberts & Schaefer Company

Roberts & Schaefer Company is an engineering and construction company serving primarily the mining industry worldwide. From the date of establishment in 1903 until 1973 the only office of Roberts & Schaefer was in Chicago. With the focus of the company turning from exclusively coal mining operations to the precious and base metal industries, the company decided to open an office in Salt Lake City in 1973. The first Salt Lake office was on 2100 South and West Temple, but has been located in the International Center for the past fifteen years. The current staff of our Salt Lake operation is eighty-five persons with the structural group consisting of twenty-four engineers and designers. Additionally, Roberts & Schaefer has offices in Australia, Poland, and Indonesia.

Roberts & Schaefer's projects range from turnkey, which includes engineering, procurement, and construction, to engineering consulting. Recent projects include the design and construction of a downhill conveyor and coal storage facility for Bowie Resources in Western Colorado and a crushing,

conveying, storage, and loadout facility for Genwall Coal in Central Utah. Roberts & Schaefer has also recently provided engineering services to Lurgi Metallurgie in conjunction with their work for proposed modernization work at Geneva Steel.

Roberts & Schaefer has been a long-time provider of engineering and construction services for the coal industry in the Powder River Basin of Wyoming, having designed



Jacob's Ranch, Wyoming; 6,000 TPH Conveyor Belts

and/or constructed new facilities or major expansions for such mines as: Black Thunder, Rawhide, Rochelle and North Rochelle, Jacob's Ranch, Antelope and North Antelope, Belle Ayr, and Eagle Butte.

Throughout the United States, Roberts & Schaefer is currently building or has recently completed projects for The Port of Los Angeles and Southdown Cement in California, South Ft. Meade Phosphate in Florida, Harris Mine in West Virginia, Lamberts Point in Virginia, University of North Carolina Power Station in North Carolina, Simplot Industries in Washington, and LaFarge Cement in Alabama. Roberts & Schaefer's Salt Lake office also

regularly assists our other offices both nationally and internationally with specific engineering projects.

Structural design is a major part of each project undertaken at Roberts & Schaefer. Unique



Harris Mine, West Virginia 4-mile long conveyor

engineering challenges have included designing underground crushing facilities to overcome hydraulic uplift forces, hoppers to accept impact from 360-ton payloads, and 1,000-kip horizontal belt

Roberts & Schaefer's structural engineering group serves a key role in Roberts & Schaefer's ability to serve the industrial mining and steel industries both in Utah, the Mountain West, and worldwide.



Black Thunder, Wyoming; Semi-Mobile Truck Dump and Crushing Stations

Bruce Hale, Senior Vice President of Roberts & Schaefer Company, is a founding member of SEAU and past member of membership committee.

MESSAGE FROM THE BOARD (continued from page 1)

Although the conception and design of these buildings began some 40 years ago, they would still today comply structurally with the current New York Building Code.

The lateral wind design force is four times larger than the zone 4 seismic forces in Los Angeles.

Only 1/3 of the columns in any given floor are spliced at that floor level.

The towers were designed to withstand the impact of a Boeing 707 flying at approximately 180 mph. The much larger jets used in the terrorist attacks were estimated to be traveling as much as 360 mph at impact (and fully loaded with fuel).

There were 59 columns in each exterior face. It is believed that two thirds of the perimeter columns in the face of the building were badly damaged or destroyed at impact. Other columns may also have been damaged.

As of 21 days after the attack, the fires were still burning and molten steel was still running. What concrete that wasn't pulverized into

dust will continue to be removed for weeks to come. The structural steel is being removed and shipped by barge to be recycled.

All photographs shown on television, shot-on-site were pre-approved by the FBI. We were shown photographs that were not released for public view.

As a result of the events of September 11, the Structural Engineers Association of New York took upon the task of assisting in the search and rescue mission (and in the debris removal mission). Hundreds of New York structural engineers have volunteered to work in eight-hour shifts around the clock. They are also performing rapid visual inspections of some 400 other buildings in the area with potential damage.

After the attack one tower stood for one hour, the other tower stood approximately 1 ¾ hours! **This was enough time for many people to exit the building, and many lives were saved.**

As bad as this disaster was, it could have been much worse. The WTC

has the capacity to hold some 51,000 people. Counting people who were able to leave the building, and people who for whatever reason were not in the building, the survival rate was approximately 90%. The survival rate at the pentagon was 99.5%. Both planes were 78% and 74% empty.

The lives that were tragically lost, have not only affected families, friends, and businesses, but have also greatly affected this nation and the entire world.

This disaster has also made the public once again aware of who structural engineers are and what vital rolls we play in our society. The value of good engineering is once again beginning to be recognized.

A task force is now investigating the disaster area. They are hoping to further evaluate the actual collapse and to provide recommendations for future construction of high profile / "Icon" buildings.



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:

OGDEN ICE ARENA

The Ice Sheet at Ogden was completed in April of 1994. The facility was originally built in preparation for the 2002 Winter Olympics and is fitted with an Olympic hockey rink.

The structure is comprised of long-span open-web steel trusses spanning the sheet a distance of approximately 150 feet. The trusses are supported by open web girders at each end and steel columns located along primary structural lines. The foundation consists of standard spot and continuous spread footings. Lateral support is provided by a system of masonry and concrete shear walls. The facility has the capacity to seat approximately 2,000 spectators.



Although the debut of curling in the Olympics occurred quite recently (Nagano, 1998), the sport of curling dates as far back as 1540 in Scotland. The Ice Sheet at Ogden will be highlighted during the 2002 Olympics as it serves as the venue for curling.

CONTACT SEAU

For any information concerning the Structural Engineers Association of Utah or association activities, contact:



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Peggy Ogzewalla, Executive Director

CLASSIFIEDS**STRUCTURAL ENGINEER**

Established consulting firm looking for talented project engineer with 3-10 years building design experience. Opportunity for productive engineer to grow with company. Send resume and statement of interest to:

CALDER-KANKAINEN, Inc.
307 W. 200 S. Suite 4002 SLC, UT 84101
FAX 328-2737

IMMEDIATE OPENING

EQE/Allen & Bailey has an immediate opening for a senior structural engineer with 15 years or more experience in structural/seismic design and analysis of buildings, as well as verbal/writing and business development skills. SE license desirable. Contact Jim Bailey at 328-0278 or John Masek at 333-7676.

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:

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1515 South 1100 East, SLC, UT 84105, Phone 486-3883,
Fax 485-0911

Email: jjohnson@reaveley.com

BULLETIN BOARD

SEAU MEMBERSHIP APPLICANTS

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

1. Benjamin Jacobsen, *Associate*



NATIONAL SECURITY ALERT

Architects & Engineers: GSA, AIA, and NSPE have issued an alert on plan requests.

The GSA, AIA and NSPE have issued a joint letter to the design and engineering community to alert them about past and current requests for plans that appear unusual in light of the September 11th attacks.

Suspicious have been aroused due to the structures involved or type of information solicited. Reasonable caution is in order. The FBI advises design professionals to report any unusual requests for plans to the appropriate local FBI field office and to the National Infrastructure Protection Center at FBI Headquarters. View the full text of this announcement at: <http://www.aia.org/letter/>

SEAU thanks the following organizations for their support of the Structural Masonry Code Seminar:

Expand your Design Options

Expanded Shale Lightweight Aggregates

**Structural Lightweight Concrete
Masonry
Horticulture
Geotechnical Fill**

Uaino

We're here for you!

SEAU Presents:

WALLACE F. BENNETT FEDERAL BUILDING REMODEL & SEISMIC RETROFIT

Presentation by:

Ian Aiken, Ph.D., P.E., Seismic Isolation Engineering
E. Jeff Jafarzadeh, General Services Administration
Marty Kemsley, AIA, Gilles Stransky Brems Smith Architects
Parry Brown, S.E., Reaveley Engineers & Associates
Domingo Moran, Reaveley Engineers & Associates



Thursday, October 18 2001

5:30 p.m. Social Hour

6:00 p.m. Meeting and Presentation



Location:

University of Utah
Engineering & Mines Classroom Building
Room 104

- Topics of discussion will include GSA selection procedures, non linear analysis modeling, advantages of using a hysteretic damping lateral system, and design and construction coordination.

STRUCTURAL ENGINEERS ASSOCIATION OF UTAH

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