

SEAU NEWS

The Newsletter of the Structural Engineers Association of Utah

Volume III- Issue IV January 1999

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.

*If you wish to submit articles for publication, please contact:
Scott Adan, the Editor
at (801) 486-3883 or*

E-mail sadan@reaveley.com



*The New Novell Building H, Eight Story Steel Moment Frame, Provo, Utah.,
Structural Design By Reaveley Engineers and Associates.*

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JANUARY EVENT

TOPIC:

“Structural Design of the Tallest Buildings in the World”

SEAU Membership Meeting:

Tuesday, January 19, 1998

5:30 p.m. Social

6:00 p.m. Technical Session

Presented By:

Charles H. Thornton, Ph.D.
Thornton-Tomasetti, Structural
Engineers, New York City, New
York

Location:

University of Utah
Engineering and Mines Classroom
Building, Room 103

MESSAGE FROM THE BOARD

PROFESSION VERSES VOCATION



By Ron Dunn, SEAU Member of the Board/UEC Delegate Elect

It is the board's desire that each member (and prospective member) of SEAU understand that as members, we have an important role and much to contribute to our own Professional Society. The Structural Engineers Association of Utah is a professional organization providing a forum and resource for the promotion and support of the structural engineering profession. For several years I remained on the sidelines of participation in this great organization. I have since become

aware first hand of the effort and dedication of the many members who contribute to the success of this organization. At the risk of embarrassing Kelly Calder, it is important for each member of SEAU to know that he is unselfishly working very hard for our behalf. If we all had his dedication, SEAU would be a very powerful organization. Get involved, join a committee.

Each of us has chosen a challenging and noble profession. It is wrong to assume that the promotion of our profession in this region is not our responsibility. In fact, it is not only our responsibility, but our obligation if we care about the future of structural engineering in the State of Utah. It is very important, and a valuable part of our engineering experience that we learn from and associate with our fellow engineering professionals. This can take place easily by serving on a committee in an area that is of interest to us. If you do not get involved, your valuable input will go unnoticed. Get a life, join a committee.

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:

Tanner, Smith & Associates

Tanner Smith & Associates, Structural Engineers (TSSE) is pleased to present the Member Focus portion of SEAU's newsletter. TSSE has been in business since 1992 and is located in Bountiful, Utah. We provide structural engineering services for a wide variety of building structures. Several of our favorite projects are:

East High School Classroom Addition

This project replaced the existing classroom portion of East High. It was a four story steel moment frame classroom addition which tied the existing gymnasium on the north to the existing auditorium on the south. This addition had to be erected and in service before the existing classrooms could be demolished and removed.



East High addition connecting the gymnasium and auditorium.

An interesting aspect of the project was that the existing boiler room had to remain in service while the new building was erected all around it. One of the structural challenges of the project was to support four levels of

brick veneer on a structural steel shell and allow for differential movement between floors.

BYU Lee Library Addition;

This 225,000 square foot addition to the existing library is a three level underground structure. Even the roof is buried and grass will grow on top. The structure is all concrete with over 30,000 cubic yards required. The lower foundations consist of two large mat foundations and the upper foundations are conventional spread and spot footings. The suspended levels are 12" thick flat plate. The exterior walls approach 60 feet in height and were up to 24" thick. Some of them were reinforced with transverse hair pin ties to reduce their thickness and to resist the high shear stresses from the retained earth.



Lee Library addition looking toward the Administration Building.

Some areas of the roof had to be designed to support fire fighting equipment. There is a steel and glass atrium entry area on the south end of the building which allows access to the building, but this is the only exterior architectural feature of the building.

Idaho State U. Linear Accelerator;

This structure was built into the side of a hill and buried with up to 15 feet of soil.



Tuacahn Amphitheater audio and visual control booths.

This was done to protect the environment from possible radiation exposure from the accelerator equipment. Several tall triangular shaped walls provided a stunning architectural prospective and in some places retained a significant amount of soil. The roof of the structure was concrete pan and joist. The joists were up to 24" wide by 40" deep with 30" wide pans in between.

Tuacahn Performing Arts Center;

This project was built near St. George, Utah in a pristine setting with beautiful red rock hills all around. It consists of several buildings including a school, an outdoor amphitheater, costume and dressing rooms, and a ticket office.



Tuacahn Amphitheater audio and visual control booths.

The audio and visual control booths were built into the vertical face of a hill and had large cantilevered elements which extended over the audience. The stage area was designed to accommodate a controlled flood during performances.

TSSE supports SEAU in its efforts to promote the engineering profession and serve the community. All of our engineering staff are members of SEAU. Leon Tanner is a past president of SEAU, Dave Smith is this years Secretary/Treasurer, and Don Barfuss is serving as the Membership Committee Chairperson.

MESSAGE FROM THE BOARD (continued from page 1)

Although structural engineering has a very limited clientele compared to other professions, the results of our work affect the masses. Most other professions only affect the client or individual requesting the professional service. Our clients are not the sole users of our product. In fact, we become not only liable to our clients but to the population in general. This is one major reason value should be attached to our service. The next time you feel pressured or forced to "give away" your structural services, consider the fact you have just established your worth. Get some pride, join a committee.

The construction industry is and has been recognized as one in which the "lay person" can bone up on, and generally compete. After all, for only \$20.00 you can be guaranteed to pass the contractors license examination! I am sure that competent general contractors are very frustrated by this lack of respect and the dilution of their livelihood. Like contractors, we cannot control all aspects or individuals within our profession. However, we can insist that the bar be raised. We should not allow the exception to influence the rule, no matter what the size of the operation. Unfortunately, Architects/Engineers are sometimes treated as necessary evils, or required signatures for approval. Have we allowed or encouraged this type of attitude to exist? One may

say that because building departments/inspectors or other reviewing agencies do not require more, that it is they who have reduced our need for involvement. My attitude is that we are responsible for the development of and the perception of our profession. It is only by promoting each other that we as a profession can truly command respect by our peers and the population around us. Raise the bar, join a committee.

I was not surprised to find out that the "best seller" for a major book club that specializes in technical books was "Engineering for Contractors." In bold letters it is written, "why pay high engineering costs for work you can do." I was surprised however to find out recently that oftentimes printing costs for smaller jobs exceed the costs for design services. Are not our services worth the paper they are written on? Consider that stores like Costco or Price Club, earn about \$1,000.00 per square foot per year before you submit your next proposal for just a few cents per square foot. Profession verses vocation? Get some dignity, join a committee.

Those of you who have had your network, computer or printing equipment serviced, realize that your graduate degrees and years of extensive experience are not worth a few semesters of trade tech. Some

Architectural and Engineering Firms in this area do not charge what most auto repair shops or service technicians are commanding. This is not to say that this work is not extremely valuable and worth the required costs, but rather to stimulate the fact that some things are passing us by. Some old-fashioned cost models and fee schedules need to go. Get some respect, join a committee.

The wonderful thing about serving on a committee, and becoming involved with SEAU, is the pride one should gain from the responsibility we have. Individuals surround us with all types of experience from all types of offices. Our membership includes engineers from government, private, institutional, industrial, and offices of all sizes. We can gain years of experience through this involvement. Committees have been established, chairpersons assigned/accepted, each needing assistance. Do not feel that it is mid year and your service can wait till next year. It is never to late or the wrong time to request to be a part of a committee.

I spent several years feeling that life would go on without me. I have since found out that it will and did without me. I have some catching up to do and ask that you join me in making our profession just that; a profession not a vocation.

BULLETIN BOARD

NEW SEAU MEMBERSHIP APPLICANTS

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

- Carl H. Carpenter**, Member
- Eugene E. Hawks**, Member
- Jim Deschenes** Member
- Jacob Watson**, Member

CLASSIFIED

STRUCTURAL ENGINEER

ARW Engineers is seeking a structural engineer with 2-6 years experience in design, analysis and detailing of structures. Masters degree preferred. Excellent opportunity for growth and advancement. Competitive salary and benefits. Please send resume,

transcripts and references. Attn: Dave, P.O. Box 1711, Ogden, UT 84402-0711 or fax(801) 621-6019; E-mail: davep@arwengineers.com

SEAU ENGINEER OF THE YEAR 1999 NOMINEE

Congratulations to Mr. James Bailey, P.E., S.E., President of Allen & Bailey Engineers this years SEAU Engineer of the year 1999 nominee.

**SEAU ENGINEERING
EDUCATOR OF THE YEAR
1999 NOMINEE**

Congratulations to Dr. Chris Pantelides, Ph.D., P.E., Associate Professor, Department of Civil & Environmental Engineering, University of Utah, this years SEAU

Engineering Educator of the year 1999 nominee.

**INTERNET CLASS NOW
AVAILABLE**

The 1997 Uniform Building Code is now available as a class on the Internet (for non-credit & credit). The cost of the class is only \$20 for

DOPL license holders and \$100 for everyone else. Copies of the 1997 UBC are available at a discount. You may work at your own convenience. You choose the time and place. Preview the class at: vnet.uvsc.edu or register at regcentr@uvsc.edu. For more information call (801) 222-8398 or (801) 222-8861.

CARTOON



JANUARY EVENT

▼
**“Structural Design of The
Tallest Buildings in the
World”**

▼
Meeting Date
Tuesday, January 19, 1999
 5:30 p.m. Social
 6:00 p.m. Technical Session

▼
Location:
 University of Utah
 Engineering and Mines Building,
 Room 103

▼
 Charles H. Thornton is Chairman of Thornton-Tomasetti Engineers/ the LZA Group, Inc., a 350 person organization providing engineering and architectural services, failure

analysis, hazard mitigation, and disaster response services. He holds a B.S. degree from Manhattan College, and M.S. and Ph.D. degrees from New York University. He was elected to the National Academy of Engineering in 1997.

Dr. Thornton has overall responsibility for engineering design, and R & D activities and policies for the firm. His thirty-eight years experience has included involvement in the design and construction of hundreds of millions of dollars worth of projects in the U.S. and oversees, ranging from hospitals, arenas and high-rise buildings, to airports, transportation facilities and special projects. Representative projects

include: the New York Hospital, New York; Chicago Stadium (Bulls and Blackhawks arena) and Comisky Park in Chicago; Terminal #1 at JFK Airport in New York; the 95-story Petronas Twin Towers of Kuala Lumpur City Centre, the world’s tallest buildings in Kuala Lumpur, Malaysia; the 50-story Americas Tower in New York, the 64-story One Liberty Place in Philadelphia; and the 50-story Chifley Tower in Sydney, Australia.

Dr. Thornton will primarily focus the session on the structural design of the Kuala Lumpur City Centre.

UPCOMING EVENTS

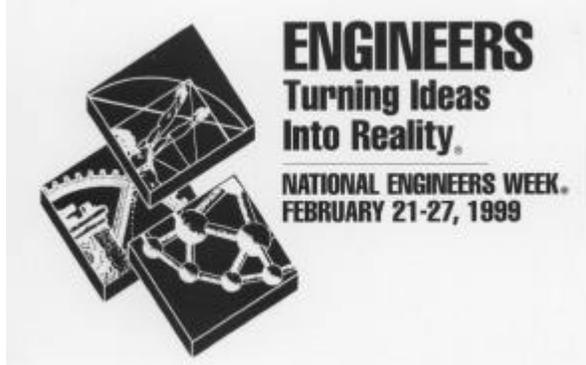
FEBRUARY NEWSLETTER AND MEMBERSHIP MEETING

There will be no SEAU newsletter in February. In addition, there will be no general membership meeting in February. Please support Engineers Week and the events associated with it.

FEBRUARY ENGINEERS WEEK

National Engineers Week is celebrated across the country each year at the time of George Washington’s birthday. Prior to becoming our nation’s first president, Washington was a military engineer and a land surveyor. During the week of February 21-27, 1999, engineers around the country will visit K-12 classrooms to talk with students about what engineers do and show practical applications

of math, science and engineering. Many of the national events will take place in Washington D.C. Information on national events and on how you can develop local events (for this year and for future years) can be accessed at <http://www.eweek.org>.



ENGINEERS WEEK BANQUET

“ENGINEERS TURNING IDEAS INTO REALITY”

Featuring:
 Robert E. Hinchee, Ph.D., P.E.
 Senior Technical Manager, Parsons Engineering

The Engineer of the year 1999 award and the Engineering Educator of the year 1999 award will be announced at the Banquet. Please come and support SEAU’s Nominees:

SEAU Engineer of the Year 1999 Nominee:
 Mr. James Bailey, P.E., S.E., President, Allen & Bailey Engineers

SEAU Engineering Educator of the Year 1999 Nominee:
 Dr. Chris Pantelides, Ph.D., P.E., Associate Professor, Department of Civil & Environmental Engineering, University of Utah

DATE: Saturday, February 27, 1999
TIME: 6:30 p.m. Social Hour
 7:00 p.m. Dinner
LOCATION: Double Tree Hotel
 255 S. West Temple
 Salt Lake City, UT
COST: \$29 General Admission
 \$18 Students

For information and tickets, contact SEAU’s UEC Delegate: Sarah Winkler, EASE, Inc.
 250 East 300 South, Suit 200
 Salt Lake City, UT 84111

(801) 539-0100

or, UEC’s E-Week chair:
 Sam Love, Love Engineering
 850 24th street
 Ogden, UT 84403
 (801) 392-4211

or, UEC’s Executive Secretary
 Susan Merrill, Utah Engineers Council
 3222 West 5070 South
 Salt Lake City, UT 84118
 (801) 967-3234

ICBO, UBC EARTHQUAKE REGULATIONS SEMINAR

SEAU AND UTAH DOPL PRESENT:

“ICBO, UBC EARTHQUAKE REGULATION SEMINAR”

Two Day, Two Part Seminar:
 Day 1, Part 1: Overview of UBC Earthquake Static Load Provisions
 Day 2, Part 2: Detailing Provisions, Elements of Structures, and Dynamic Analysis Procedures

SEAU members may attend one or both seminars.

COST: \$40 One Seminar, \$80 Both Seminars
DATE: Part 1, Thursday, February 25, 1999
 Part 2, Friday, February 26, 1999
LOCATION: SL Airport Hilton, 5151 West Wiley Post Way
TIME: 8:00 a.m. to 5:00 p.m.

Separate registration materials will be sent shortly.

MARCH MEETING

Topic: “To Be Announced”

Speaker: TBA

Thursday March 18, 1999
 5:30 p.m. Social
 6:00 p.m. Technical Session

Location:
 University of Utah
 Engineering and Mines Bldg., Room: TBA

NEWSLETTER SUBMITTALS

This SEAU Newsletter is designed to keep you informed of events and activities that affect our association and your involvement with SEAU. In addition, the newsletter can be a forum for you to share your views with your fellow engineers, post advertisements, or target a very select group of professionals.

Please have articles or advertisements delivered to Scott Adan, c/o Reaveley Engineers & Associates, Inc., 1515 South 1100 East, Salt Lake City, Utah 84105, Phone 486-3883, Fax 485-0911. Submittals may also be received via email at sadan@reaveley.com. Typically, the newsletter will be published by the second Wednesday of the month in order that the members will receive their copy before the meetings held on the third Thursday of each month. Therefore, the newsletter committee will only accept articles and advertisements in accordance with the following deadlines:

Newsletter Issue	Submit by Date	Publish Date	Meeting Date
March 1999	Mar. 5, 1999	Mar. 8, 1999	Mar. 18, 1999
April 1999	Apr. 2, 1999	Apr. 5, 1999	Apr. 15, 1999
May 1999	May 7, 1999	May 10, 1999	May 21, 1999

UTAH SEISMIC SAFETY COMMISSION IN THE NEWS

REPORT ON THE UTAH SEISMIC SAFETY COMMISSION

by Jim Bailey, January 1999

The USSC held their quarterly meeting in January. The following items were addressed at the quarterly meeting:

Warm Springs Fault:

The first part of the commission meeting was taken up reviewing the findings of geologists in the Salt Palace Expansion excavation. I am sure most of you have already read about it in the papers, and what follows may be old news by the time you read it. At about 23 feet down, a small graben and sand boils were discovered. It is believed by geologists that the geologic features are tectonic in nature, and correspond to an extension of the Warm Springs Fault. The graben is about 15-20 feet wide and 3 feet deep. It was caused by liquefaction. The graben runs north and south through the middle of the excavation and likely extends under the previous expansion. At this point, January 8, work has been suspended for 30 days so more studies can be done. The water table is a lot lower now than it was when the graben was created, and geologists agreed at the meeting that the liquefaction potential at the site no longer exists. However, being geologists, they are all pretty excited by the discovery, as it represents the first evidence of faulting directly beneath downtown

Salt Lake. As you may have read in the paper, they may even stop construction altogether and move the site. (Personally, I think they are overreacting, but I am not a geologist and not paid for my opinions.)

Web Article:

If you would like a better insight into the way politics work in this state, I highly recommend that you read the article on the Internet located at the following web site: www.colorado.edu/hazards/wp/wp101.html. The title of the article is "A Case Study of the Re-establishment of a Utah Seismic Safety Commission."

School Seismic Review:

As you may have read, Scott Bean, the Commissioner of Public Education for Utah, retired in the last couple of months. The USSC had obtained his support toward requiring a 90 percent seismic peer review on new school buildings. We will likely have to repeat some of our efforts with his replacement. In a related issue, the Governor will issue a proclamation in the near future on School Earthquake Safety Week.

Retrofit Triggers:

I reported to the USSC on the UBC Commission Structural Advisory Committee meeting held in December. Eric Kankainen, who serves on the Commission, invited myself, Jeff Miller, and others to discuss with the committee what we might do to ensure that some seismic retrofit work occurs when old buildings on the west side of Salt

Lake get remodeled into offices, condominiums, restaurants, etc. At present, the City has no strong policy or requirement for seismic upgrade. Jeff Miller will review what is being done in California to trigger seismic retrofit work. The group felt that this might be a hot topic for the SEAU Seismic Committee to work on. To have something to discuss, I wrote and passed out a sample law: "When additions, alterations, or repairs within any 12-month period exceed 50 percent of the value of an existing building or structure, and the building or structure will have an occupancy in excess of 10 persons on a regular basis, such building or structure shall be seismically retrofitted to at least 75% of new construction code force levels. Recognized methods of analysis and retrofit, such as the NEHRP provisions, the UCBC, or UBC, shall be used with the emphasis on collapse prevention and life safety. Whenever a building is re-roofed, parapets shall be braced and seismic ties between the roof structure and walls shall be installed. For structures converted to condominiums, stores, or offices, the Owner and/or Seller will be required to notify occupants in writing whether or not the building has been seismically retrofitted and to what degree." The change of occupancy trigger does not always work. An example would be changing from an apartment building to an office building, which would be the same occupancy classification. Tying into the value of the work and occupancy level seemed to be a better approach. Carl also felt that developers would get around the 50 percent in 12 months requirement by spreading the work out.

Getting Involved:

Structural engineers in Utah have at least 3 avenues available to focus our energies and get something done to promote seismic safety. These avenues include the USSC Engineering and Architecture Committee chaired by Ron Dunn, the UBC Commission Structural Advisory Committee chaired by Carl Eriksson, and the SEAU Seismic Committee chaired by Ken Willmore. Please contact one of these people if you want to get involved.

Project Impact:

Mike Stever, who is Salt Lake's emergency program manager, reported on a federal disaster grant from FEMA called Project Impact. The goal of the program is to build disaster resistant communities. Salt Lake is a second round pilot city and one of 7 communities across the country. \$300K is to be spent. One major goal of the program is to reduce loss of life and property after a natural disaster through awareness and education.

USSC Web Page:

The USSC is moving ahead to create web page. It will serve as a very specific funnel to disseminate documents on seismic safety. SEAU member Barry Welliver is in charge of the project. The web site is about 2 months away. Hopefully, it will create an enlarged audience for awareness, education, and public policy making. Barry is also chairman for SEAU web page creation.

MEMBERSHIP FORUM

ADVANCEMENTS IN STRUCTURAL CONCRETE REPAIR

by **Bruce Collins, Restruction Corporation**

There are many forms of deterioration in structural concrete. Corrosion of the reinforcing steel, improper air entrainment, and structural abuse are leading causes. Each structure, when repaired, has a unique solution that combines cost effectiveness with durability.

The methods of construction to achieve concrete repair durability are well documented but are not common knowledge within the engineering and construction community. This article will focus on recent research, advancements and sources of information available to complete durable concrete repairs.

Designing Durability

The engineering condition survey will define the cause and extent of the deterioration. This is a critical factor in defining the unique solution for each structural repair. Surface preparation of the concrete is key to the success in bonding new concrete to existing. This has been verified time and again in field research performed by good engineers. The proper surface prep parameters to look for are depth of cavity,

cleanliness of parent concrete and soundness of concrete.

Many engineers have been led to believe that 1/2" thick concrete repairs are acceptable practice in concrete repair. This can work, but lowers the probability of success. This practice should be avoided where possible. ACI Committees 201 "Durability" and Committee 546 "Repair of Bridge Superstructure" both recommend minimum thickness of concrete to be 1-1/2". ACI Committee 362 "Parking Structures" includes a drawing where patches are shown to always encapsulate the embedded reinforcing steel. Shrinkage of the repair material will affect its durability. Cement mortars used as 1/2" thick repairs contain no larger aggregates, increasing shrinkage. Research conducted by the Army Corps of Engineers and Alberta Department of Transportation found that only 7 of 46 leading proprietary mortar materials tested exhibited lower shrinkage than portland cement. 17 of 46 materials had shrinkage 3 times greater than portland cement. The International Concrete Repair Institute Guide 03733 "Guide to selecting and specifying materials for repair of concrete surfaces" categorizes materials based upon shrinkage values. Cavity depth should be the approximately the same depth up to the edge of the patch (many contractors chip patches to a "saucer" shape). This will minimize shrinkage stresses within the patch. Specifying

depth of cavity and material shrinkage is easy when using these guides as reference.

Cleanliness of the parent concrete cavity is more difficult to specify. However, concrete cleanliness facilitates bond, which is easily specified. ACI 503 "Adhesives" and The International Concrete Repair Institute Guide 01450 "Guide to using In-situ pull-off tests to evaluate bond of concrete surface repairs" describe tests and give recommended values for bond strength. Virginia DOT, Roadways of Germany, and AASHTO all specify bond strengths greater than 200 psi. Contractors using good surface preparation methods should easily obtain these values. Recent field studies by FWHA confirm previous research that these bonds can be achieved even without use of bonding agents. Bonding agents may increase the comfort level of the engineer, but do very little to increase the durability of the repair.

The tools used to remove damaged concrete are also instrumental in achieving good bond. Some engineers are uncomfortable specifying removal methods, seeing conflict with "Means and methods" clauses in insurance policies. Use of the wrong removal tool can damage the parent concrete inhibiting bond. Excellent field research completed by Michael Sprinkel, Virginia Transportation Research Council, documents good

removal methods. This research is available through ICRI or the October/November 1997 issue of Concrete Repair Digest.

Factors affecting concrete repair durability can be specified using

performance parameters. Specifying removal depths and ICRI Guide 03733 shrinkage values will eliminate the use of mortars as structural concrete repair materials. Specifying minimum composite bond strength will eliminate abusive removal tools,

and insure concrete cleanliness. Performance parameters, essentially quality assurance measurements, are the foundation of durability guarantees provided to structure owners.

NEWLETTER SPONSORSHIP

Specialist in Structural Repair



Colorado: P.O. Box 343
Sedalia, CO 80135
303-688-8244
Fax 303-688-6733

Utah: 3681 W 1987 South
Salt Lake City, UT 84120
801-972-1190
Fax 801-972-1377

Bruce A. Collins, Vice President Business Development - Chris Weight, Utah Region Project Engineer

Specializing in Repair and Strengthening Construction

Structural concrete patching and overlays
Steel frame construction
Carbon Fiber strengthening
Post tension tendon protection and grouting
Shotcrete strengthening and placement
Corrosion repair in structural concrete
Urethane soil grouting and stabilization

Epoxy injection, waterproofing, crack repair.

Activities

National Board of Directors, International Concrete Repair Institute
ACI Committee 546 Chair "Repair of Concrete"
ACI Committee 503 Secretary "Adhesives for Concrete"
Rocky Mountain Chapter ACI President
Authors of over 20 industry published papers.

FINAL AMENDMENT TO THE UTAH UBC

The final revised amendment to the Utah Uniform Building Code has been submitted for Section 1806. The estimated cost for the additional rebar required for this amendment, beyond what the current amendment requires is about \$1,50 to \$2.00 per foot of wall. For a 25' x 40' basement (1000 sf of footprint) the additional cost would be \$195.00 to \$260.00 for each house. This assumes that contractors are currently using four horizontal bars, while this proposal requires six, and vertical bars are currently placed at 24" o.c., while this proposal requires 16" o.c.

The current state amendment which has been in effect for about 8 years now, fails to address certain issues, such as whether this amendment applies to a home that has had engineering on the superstructure; size of lintels; location of vertical and horizontal steel; corner reinforcing; the relationship to Section 1806.7.1; whether or not special inspection is required; the concrete strength required, etc. All of these issues and more are covered in this revision to the amendment.

Because it covers more than just the foundation wall, it was felt that it is more appropriately located in Chapter 18, and with revision to the title, as proposed, it fits logically into place.

Implementation of this amendment should result in greater uniformity throughout the state, as it addresses many issues previously left to the discretion of the inspector. The amendment appears as follows:

1. Revise the Title of Section 1806 as follows:

SECTION 1806 — FOOTINGS AND FOUNDATIONS

2. Revise Section 1806.11 as follows:

1806.11 Empirical foundation design. Group B Division 3 Occupancies three stories or less in height, and Group U Occupancies, which are constructed in accordance with Section 2320, or with other methods employing repetitive wood-frame

construction or repetitive cold-formed steel structural member construction, may have foundations constructed in accordance with Table 18-I-D

4. Add Table 18-I-D as follows:

TABLE 18-I-D — EMPIRICAL FOUNDATION WALLS^{1,8}

Max. Height	Top Edge Support	Min. Thickness	Vertical Steel ²	Horizontal Steel ³	Steel at Openings ⁴	Max. Lintel Length	Min. Lintel Depth	Max. Grade Differential
2 ft	None	6 inches	Note 5	2 - #4 Bars	2 - #4 Bars above; 1 - #4 Bar each side	2 ft	Two inches for each foot of opening width; Minimum 6"	1 ft- 6"
4 ft			#4 @16"	4 - #4 Bars		3 ft		3 ft- 6"
6 ft	Floor or roof diaphragm	8 inches	#4 @12"	5 - #4 Bars		6 ft		5 ft ⁷
8 ft				6 - #4 Bars		6 ft		5 ft ⁷
9ft				7 - #4 Bars		6 ft		5 ft ⁷
Over 9 ft	Engineering required							

¹Based on 3000 psi concrete and grade 40 reinforcement steel - special inspections not required.
²To be placed in the center of the wall, and extend from the footing to within 3 inches of the top of the wall; Dowels of #4 rebar with standard hook shall be provided in the footing to match the vertical steel, with the vertical leg extending 24" into the foundation wall.
³One bar shall be located in the top 4 inches, one bar in the bottom 4 inches and the other bars equally spaced between. Such bar placement satisfies the requirements of Section 1806.7.1. Corner reinforcement shall be provided so as to lap 24".
⁴Bars shall be placed within 2 inches of the openings and extend 24" beyond the edge of the opening; vertical bars may terminate 3 inches from the top of the concrete.
⁵Dowels of #4 rebar @24" on center with a standard hook, shall be provided in the footing, with the vertical leg extending to within 3" of the top of the foundation wall.
⁶Difference in grade from one side of the wall to the other.
⁷Difference in grade from the highest grade to the lowest grade on the perimeter of the foundation.
⁸The footing shall have a minimum width of 20" and a minimum thickness of 9".

SEAU MEMBERSHIP DIRECTORY UPDATES

New Membership Directories for the 1998-1999 year are being prepared. Please review your 1997-1998 listing and provide any corrections needed. Return corrections to:
 SEAU P.O. Box 58628 Salt Lake City, Utah 84158-0628 by February 1, 1999.

Title (Mr., Mrs., Ms., etc.) _____

Name (Last, First, Middle) _____

Credentials (P.E. S.E. etc) _____

Membership Grade (Member, Associate, Affiliate, etc.) _____

Employer _____

Mailing Address _____

City _____ State _____ Zip Code _____

Telephone (include Area Code) _____

Fax (include Area Code) _____

E-mail _____

THE STRUCTURAL ENGINEERS ASSOCIATION OF UTAH

Presents:

Structural Design of the Tallest Buildings in the World

Presented By:

Charles H. Thornton, Ph.D.

Thornton-Tomasetti, Structural Engineers, New York City, NY

Tuesday January 19, 1999

5:30 p.m. Social

6:00 p.m. Technical Session

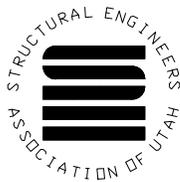
University of Utah, Engineering and Mines Classroom Bldg., Room #103

(For Additional Information Please Contact: Newland Malmquist, Programs Chairman (801) 972-2634)

STRUCTURAL ENGINEERS ASSOCIATION OF UTAH

P.O. Box 58628

Salt Lake City, Utah 84158-0628



Board of Directors

Kelly Calder, President

A. Parry Brown, Vice Pres./Pres. Elect

Craig A. Cartwright, Past President

David Smith, Secretary/Treasurer

Sarah L. Winkler

Steve Judd

Ron Dunn