SEAU *NEWS*

The Newsletter of the Structural Engineers Association of Utah

Volume IV- Issue VII May 2000

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 or advertisements for publication may be submitted to:
Scott Adan, Editor
at (801) 486-3883
sadan@reaveley.com
or
Mike Buehner, Advertising
at (801) 486-3883
mbuehner@reaveley.com

Pegasus Gold, Florida Canyon Mine Rock Crushing Facility, Winnemucca, Nevada structural design by R&M Engineering.

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MAY PROGRAM

"The Use of Ground Improvement and Specialty Foundations to Address Seismic Mitigation in the Wasatch Region"

Presented By:
Glen A. Gorski, P.E., CPG
Hayward Baker Inc.

Program Date:
Thursday May 18, 2000
5:30 p.m. Social
6:00 p.m. Presentation

Location:
University of Utah
Engineering and Mines Building
Room 105
Salt Lake City, Utah

MESSAGE FROM THE BOARD

ENGINEERING OUR PRIORITIES

By David Alter, SEAU Member of the Board/UEC Delegate Elect

So as I sat down to write this article, my 12 year old son asked me why I had to do it. After all, he needed help with his math, and I was the guy to do it. I stood in the doorway pondering his question, when my wife explained to him that the members of this engineering organization voted me in, and entrusted me with this position. I listened intently for any other inspiring words. She explained that with this position come responsibilities. Writing this article is one of those responsibilities. I was deflated. I was hoping she would come up with some way I could get out of doing it.

I pondered about potential subject matter. Finally, it was apparent that my mind was empty, so I had to get back to basics. We are going into the summer months, and therefore the busy season for our profession. Let's not get our priorities out of whack. If you feel you must engineer, calculate the tension on the ski-rope as you are pulled out of the water.

In order to keep your attention, I will cover five topics of interest:

1. Are you satisfied with your career?
2. Do you make enough money to put bread on the table, keep a roof over your heads, and have some fun?
3. Are you making a contribution to society?
4. Do you take pride in your profession?

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:

Palmer Engineering & Development

The firm of Palmer Engineering & Development was originally set up in 1983 as Glen Palmer left full time employment at the LDS Church Engineering Group, but continued working with the LDS Church as a consultant in monitoring of structural repairs on the concrete parking plaza below the Church Office Building in Salt Lake City. This first project continued during the next 18 months as Glen Palmer worked on a masters degree. The fourth engineering project performed by Palmer Engineering was the first after beginning full time operations in 1992, with the intermediate projects being residential structural designs done over the 9 year time span between 1983 and 1992. A common misconception left by the company name is that of land or project development, which misconception has nearly led to the change of the name several times. No typical "Development" has been done, nor is it projected for the future! The company began operations in the Salt Lake area, and opened a part time office in St. George two years later. The main office shifted to the St. George office in 1996 when Glen Palmer moved to St. George. Currently there are 4 employees in this small firm.

Since 1992 Palmer Engineering has continued providing structural engineering services for a variety of clients. Interesting projects have included new construction, renovation of historic structures, and forensic investigations.

The largest new construction project was the Provo Deseret Industries Building, a 95,000 sf structure built to house a new store as well as offices, training classrooms, and drop-off/production/sorting facilities.

Three Story Office Building

Structural renovation and seismic upgrade projects have included the American Fork Tabernacle, Provo Tabernacle, and Kolob Stake Building, among others. Some unique aspects have included wood trusses with segmented arched bottom chords, rock-filled trench foundation systems converted to basement space, and the typical unreinforced masonry wall systems commonly used in many older structures. Upgrading of adobe structures in Southern Utah has also been included.

Two Story Bank

The majority of our work load has shifted to the southern Utah and southern Nevada area over the last few years. Current projects under construction include a 27,000 sf two story pre-cast concrete structure with masonry shear walls in Las Vegas, and a 25,000 sf four story steel and wood frame office building in St. George. Work in southern Utah is often quite different with the many variations in soil conditions, leading to many unique foundation systems used. Deep pier foundations are fairly common to isolate the building from the near surface soils, often creating lateral stability questions.

Two Story Office Building

As the firm became more engaged in the southern Utah and surrounding areas it has become more active in coordination with local building officials. We have become instrumental in helping move forward the professionalism included within construction of structures in these smaller communities. We have tried to push forward the ideas of further wind studies, more clear design criteria, and full implementation of code requirements. We feel we have been very helpful in getting these smaller communities to understand the importance of the structural code requirements.

Glen Palmer has served for SEAU on the advisory board to the American Arbitration Association, and worked on several committees for PCI.

MESSAGE FROM THE BOARD (continued from page 1)

5. Are you keeping your technical and social skills current?

So let's go over these items one by one, shall we? Number 1 - Are You Satisfied With Your Career?
A few years ago, we hired a young engineer, fresh out of school, who had labored diligently for five years to obtain his degree in civil engineering. After working a few months, he came to my office and explained that he wasn't sure he wanted to be an engineer. I offered to give him other assignments, but a few days later, he turned in his resignation. I was sad to see him go, but conceded that if he wasn't happy, then I probably couldn't change his mind. To my surprise, about two months later I was contacted as a character reference, as our engineer had applied to become a fireman! Apparently, this career path was not what made him happy. I'm just glad he figured it out before working for 10 or more years.

Number 2 - Are You Making Enough Money?
I was talking with another constituent a short time ago, and he told me about someone his wife works with who makes considerably more than the typical engineer. This person is a salesman for a computer-related business. His technical skills are no where near what is required to perform our work. Hearing about these kind of people sometimes bothers me, as I feel I have worked harder to get where I am. This is my mistake because, for one thing, he may have put more effort into where he is, and I'm sure I enjoy doing what I do as much or more than he. As you see people driving Mercedes and Porches around, you can bet they are likely not a civil engineer. I have thought about that from time to time, and decided that as long as I live off less than I make, then that is probably enough.

Obviously, we are not in this business just to make money (right?). Hopefully, we make enough to buy the basics and an occasional set of golf clubs or fishing gear. Until we can convince architects to pay more, we will just have to settle for doing this work because we love it (refer to Number 1 above).

Number 3 - Are You Making a Contribution to Society?
I must admit, probably the main reason I love my career is because often we get to make a genuine contribution to society. I visited the Hoover Dam a short time ago, and admired that incredible structure. The electricity generated from that facility has more than paid for itself, and will continue to do so for many more generations. Do we have that high standard of quality in mind when completing our designs?

I rode the roller coaster at Buffalo Bill's in western Nevada, and thought how incredible it is that as engineers we design such amazing structures. You remember the line in Jurassic Park when Jeff Goldblum says, "God help us, we're in the hands of engineers". That thought crossed my mind when as we climbed two hundred feet to the top of what, for a time, was the world's tallest roller coaster, only to fall at a near-vertical drop at blood-curdling speed. But I wasn't scared. That's because I knew that somewhere, someone, an engineer who knew what he was doing, had carefully calculated all imaginable forces that the 3-dimensional space frame would ever experience (then doubled them). That brought solace to my soul as we sped through the vertical loop, and around the lower corners. I felt sorry for every one else on that ride. They didn't know what I knew. Poor souls. They must have really been scared.

Number 4 - Do You Take Pride in Your Profession?
Now, when I got engaged to my wife-to-be, my parents-in-law had to show a lot of faith in me. I was still in my second year of engineering school, and wasn't too smart yet. (Maybe they just wanted to lose a daughter and not gain a son). Thank goodness I finally finished school, and obtained employment. I was excited to become an engineer; not because it would make me wealthy, but because I would take part in designing something useful to many people.

There aren't that many careers where we can admire the fruits of our labors quite like we do here. I am sure you have all experienced the excitement of seeing a building finished that you took part in designing. Quite often, this is what drives us in our work.

Number 5 - Are You Keeping Your Technical and Social Skills Current?
Last (and probably least), our chosen careers give us extraordinary abilities. But only if we keep on the cutting edge. I know of one engineer who never attends seminars, and he still does engineering the way he did 20 years ago. This is damaging not only to himself and his clients, but to our profession as well.

The profession we have chosen requires us to use our technical skills, as well as our social skills. I don't know if any of you have noticed, but as you progress in your career, your ability to sell yourself oftentimes is more important than your technical skills. The best engineers I know are the personable ones. Think about the engineers you respect the most. They probably aren't just "gear heads".

There are other advantages with having technical skills. My 12 year old (the one that asked me why I had to write this article) just loves to have me help him with his math. For whatever reason, he wants me to go over every problem. Thank goodness we can still do seventh grade math. I'm a little worried, though, when he gets to ninth grade.

MAY PROGRAM

The Use of Ground Improvement and Specialty Foundations to Address Seismic Mitigation in the Wasatch Region

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Presented By:
Glen A. Gorski, P.E., CPG
Director of Business Development
Hayward Baker Inc. – Western Region

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Program Date:
Thursday May 18, 2000
5:30 p.m. Social
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Location:
University of Utah
Engineering and Mines Classroom Building
Room 105

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The recent devastating earthquakes in Turkey and Taiwan, along with the Hector Mine earthquake in Southern California, are reminders that living in seismically active areas can be a challenge to the built environment.

This presentation will discuss some of the unique ground improvement methods and specialty foundations that can strengthen soil and foundation structures to withstand the severe dynamic forces that are unleashed during an earthquake. Ground improvement methods to be presented include Dynamic Deep Compaction, Vibro-Densification (Stone Columns), Soil Mixing, Compaction Grouting, Jet Grouting, and Mini-piles. Case histories of sites that have used ground improvement to address specific seismic design issues in the Wasatch Region will be discussed.

A brief overview of current guidelines for mitigation liquefaction in California and how it might apply to Utah seismic hazards will also be presented.

SEAU PUBLIC RELATIONS/ WEB PAGE COMMITTEE UPDATE

REPORT ON THE PUBLIC RELATIONS/ WEB PAGE COMMITTEE

by: Berry Welliver, Public Relations/ Web Page Committee Chairperson

How many of you know that SEAU has a web site?

For almost a year now the SEAU site has been up and running with information about it's history, bylaws, committees, Board of Directors and many other facts of interest to the engineering community. It was created as a valuable tool for the organization both as a public relations vehicle and a resource for the members of SEAU.

The site is located at www.SEAU.org and can be accessed through your web browser on the Internet. This site was created by David Cassett and Barry Welliver and reflects a beginning effort to establish a presence on the web. In the coming months it will evolve into a new and distinctive format with lots of additional information. The web site committee is always looking for interested individuals to help in the effort to keep the site current and add new content. Some of the planned and possible expansions include commentaries on relevant structural issues, copies of committee meeting minutes, information for public enlightenment of the roles of structural engineers and lots of links to other web sites of interest to our membership.

To keep abreast of the workings and interests of your organization, plan to visit the web site regularly. You'll find a white paper authored by the Seismic committee on Seismic Strengthening of Existing Buildings, copies of past newsletters for your reference and contacts for Board of Directors and current committee chairpersons. Also, check out the committee goals and see if you have an interest in helping out and participating. SEAU is a voluntary organization and we look to our membership to help formulate its' opinions and directions.

Some exciting areas are being explored by SEAU as it carries out its' founding principles. Review of code regulations for both new and existing buildings is an area deserving

the attentions of all practicing engineers. Through our newsletter and the web site, we learn of the accomplishments of our committees and become acquainted with one another for the betterment of our professional lives. Take part in the growth of SEAU and lend your experience to help build a strong alliance of structural engineers in Utah.

SEAU NEWSLETTER COMMITTEE UPDATE

REPORT FROM THE NEWSLETTER COMMITTEE

by: Scott M. Adan P.E., Committee Chairperson

With the publication of the May 2000 newsletter, the newsletter committee concludes another successful year with SEAU. Over the years, the committee has seen the newsletter evolve into an acclaimed professional publication. As the newsletter editor, it has been my pleasure to be a part of this transformation.

This year the efforts of committee members Rick Seelos, Mike Buehner, and Rachel Mackelprang are of particular note. Without the work of these individuals, the level of professionalism seen within the publication could not have been achieved.

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

Particular thanks goes to those individuals and firms who have contributed to the monthly focus article. This popular series has been able to focus on the diversified talents of many Utah structural engineering firms.

Looking to the future, the newsletter must continue to set the standard among other national structural engineering publications. Unfortunately, our committee cannot accomplish this goal without the assistance of the membership. Your continuing contributions of literature, opinions, articles, advertisements, effort, and time cannot be under-emphasized. This newsletter is the voice of Utah 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 over the last five years and to be associated with such an outstanding group of professionals. I look forward to the many additional opportunities to serve such a worthwhile organization.

SEAU PROFFESSIONAL PRACTICE AND ETHICS COMMITTEE UPDATE

REPORT FORM THE PROFFESSIONAL PRACTICE AND ETHICS COMMITTEE

by: Jonathan W. Richards S.E., Committee Chairperson

One of the committee's initial goals was to provide information to the SEAU membership with respect to; fee structures, costs of construction, standard practice issues, and other items of interest. I must confess that the committee was not as active as we should have been in preparing these newsletter articles. However, we have continued to pursue obtaining information on salary surveys, fee structures, etc., from other organizations. We plan to condense some of this information for print in upcoming newsletters.

It should be noted that the committee did complete an ethics related assignment delegated by the current SEAU Board of Directors. Unfortunately, it was the unpleasant task of inquiring into some alleged problems arising from the structural design services provided by a fellow engineer (not a SEAU member). It was the intent of the Board of Directors and the committee to gather some general information on this individual's projects and to provide a recommendation to the Department of Professional Licensing for possible investigation into negligence.

From our inquiries, it was apparent that one primary common factor (as well as others), led to the problems with the individual's design services. That was the failure of the Engineer of Record to perform responsible charge in reviewing an employee's work prior to releasing drawings.

I wonder how many of us as Licensed Project Managers and Principals become so overwhelmed with deadlines that we allow work to go out unchecked, assuming that our very capable design engineers have covered the design completely and correctly. I must admit that our office has been at fault on some smaller projects.

It is my opinion that providing an in house review of projects is imperative to maintaining a professional level of practice! If your firm does not have the resources to perform this work, subcontract it to one of your piers. Do not depend on the Building Department to perform this service, often times there is no one qualified to perform a comprehensive review. Also, reviewing an engineer in training's work is a critical part of the mentoring system. If you value your employees, provide adequate reviews to help them learn. I hope we can learn from others mistakes to better our own level of practice.

In addition to the above-mentioned activities, this past year I have had the opportunity to talk informally with numerous members and provide input on the "practice of structural engineering" issues. As an owner I have personally benefited from these discussions and urge other members to maintain an open dialogue amongst the membership with respect to professional practices. It is surprising how an independent opinion will help.

This coming year the membership will be asked to provide suggestions to the committee on issues you would like us to address. We welcome your input!

I appreciate the opportunity to serve as chairman of this committee and look forward to having an increasingly active committee this upcoming year.

BULLETIN BOARD

CLASSIFIED

STRUCTUAL ENGINEER
Growing multidiscipline engineering firm has an opening in our Logan office for a Structural Engineer with a minimum of 2 years experience, P.E. preferred, but not required. Excellent benefits and working environment. Salary based on experience. Send resume to:

Knighton and Crow, P.C.
95 west Golf Course Road
Suite 101
Logan, UT 84321
Attn: Ilise

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SEAU ELECTIONS

Before May 1 all PROFESIONAL grade members received a ballot listing the nominees for the various SEAU offices. The signed ballot shall be sealed and returned to the Association office before noon of the day of the regular meeting in May. The ballot shall then be counted and those receiving the highest votes shall be declared elected at the May meeting. Remember to vote!

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NEWLETTER MILESTONE

The newsletter committee is pleased to announce the final newsletter of the 1999-2000 year. Thanks for all your input and support! The next issue will be printed in early September.

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NEWLETTER SUBMITALS

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 delivered to Scott Adan, c/o Reaveley Engineers & Associates, Inc., 1515 East 1100 East, SLC, UT 84105, Phone 486-3883, Fax 485-0911, Email: sadan@reaveley.com.

Sept. Deadline: August 31, 2000

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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:

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

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HUMOR

A useless fact (with a twist) about technology:

The US standard railroad gauge (distance between the rails) is 4 feet 8.5 inches. That's an exceedingly odd number. Why was that gauge used? Because that's the way they built them in England, and English expatriates built the US railroads.

Why did the English build them like that? Because the first rail lines were built by the same people who built the pre-railroad tramways, and that's the gauge they used.

Why did 'they' use that gauge then? Because the people who built the tramways used the same jigs and tools that they used for building wagons, which used that wheel spacing. Okay! Why did the wagons have that particular odd wheel spacing? Well, if they tried to use any other spacing, the wagon wheels would break on some of the old, long distance roads in England, because that's the spacing of the wheel ruts.

So who built those old rutted roads? The first long distance roads in Europe (and England) were built by Imperial Rome for their legions. The roads have been used ever since. And the ruts? Roman war chariots first made the initial ruts, which everyone else had to match for fear of destroying their wagon wheels and wagons. Since the chariots were made for, or by, Imperial Rome, they were all alike in the matter of wheel spacing.

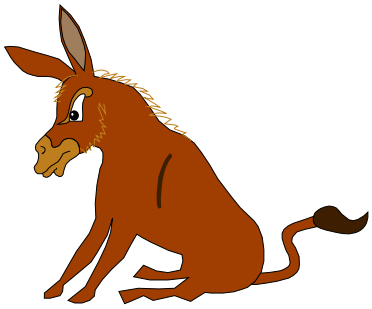
Thus, we have the answer to the original question. The United States standard railroad gauge of 4 feet, 8.5 inches derives from the original specification for an Imperial Roman war chariot.

Specifications and bureaucracies live forever. So, the next time you are handed a specification and wonder which horse's rear came up with it, you may be exactly right. Because the Imperial Roman war chariots were made just wide enough to

accommodate the back ends of two war-horses.

And now, the twist to the story... There's an interesting extension to the story about railroad gauges and horses' behinds. When we see a Space Shuttle sitting on its launch pad, there are two big booster rockets attached to the sides of the main fuel tank. These are solid rocket boosters, or SRBs. Thiokol makes the SRBs at their factory at Utah. The engineers who designed the SRBs might have preferred to make them a bit fatter, but the SRBs had to be shipped by train from the factory to the launch site. The railroad line from the factory had to run through a tunnel in the mountains. The SRBs had to fit through that tunnel. The tunnel is slightly wider than the railroad track, and the railroad track is about as wide as two horses behinds.

So, the major design feature of what is arguably the world's most advanced transportation system was determined by the width of a Horse's [rear]



SEAU Presents:

The Use of Ground Improvement and Specialty Foundations to Address Seismic Mitigation in the Wasatch Region

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For additional questions call:
Newland Malmquist (801) 972-2634

STRUCTURAL ENGINEERS ASSOCIATION OF UTAH

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