# EQUILIBRIUM

Newsletter of the Seattle Chapter
Structural Engineers Association of Washington

October 2009




## In this issue



### October Mini-Seminar

**Essential Technologies for Structural Monitoring**

Presented by

**Christoph Wimmer**
**National Instruments**

See page 3 for details

## Performance-Based Seismic Design: Where We've Been and Where We're Going

In 1994, Magnusson Klemencic Associates (MKA) began applying Performance-Based Seismic Design (PBSD) concepts developed for seismic rehabilitation to the design of new buildings. First attempts were in the form of "parallel designs," where prescriptive, code-compliant designs were completed in parallel with "displacement-based" designs; Colby Square in Everett, Washington, is a good early example.

In the late 1990s, PBSD concepts were employed in the design of Key Tower in Bellevue, Washington, on a full, system-wide basis, the first in a new breed of buildings. In subsequent years, numerous projects were completed by MKA and other firms in Washington and California following a similar, yet evolving, path.

Rigorous peer reviews were undertaken on many of these projects, further advancing PBSD. Professional engineering groups such as the Council on Tall Buildings and Urban Habitat, the Los Angeles Tall Buildings Structural Design Council, and the Structural Engineers Association of Northern California have each published guidelines for the execution of PBSD. While the three guidelines generally agree in principle, there are significant differences in some of the detailed recommendations.

The latest guideline, developed by the Pacific Earthquake Engineering Research Center and funded by the Charles Pankow Foundation, is in final draft form and intended to be a consensus document among the various engineering groups.

Ron Klemencic will take us on a journey from initial thoughts in 1994, through the sometimes painful and frustrating peer reviews, to the current state-of-the-art...and beyond.

Ron Klemencic, P.E., S.E., is President of MKA, an award-winning structural and civil engineering firm headquartered in Seattle. A graduate of Purdue (1985, B.S.) and Berkeley (1986, M.S.), Ron has 23 years of progressive design experience in 16 states and 17 countries. He served as Chairman of the Council on Tall Buildings and Urban Habitat from 2001 to 2006 and is currently a CTBUH Board member. He is also on the Board of Directors of the Charles Pankow Foundation. Ron was recognized in 2008 as one of Engineering News Record's "Top 25 Newsmakers" for his work advancing performance-based seismic design.

*October featured speaker Ron Klemencic,*

### Meeting Information:

**Date:** **Tuesday October 27, 2009**

**Place:** **McCormick & Schmick's Harborside**
**1200 Westlake Ave N, Seattle**

**Time:**

| | |
|---|---|
| **5:15—6:00 PM** | **Mini-Seminar** |
| **5:30—6:30 PM** | **Social** |
| **6:30—7:45 PM** | **Dinner** |
| **7:45—9:00 PM** | **Program** |

**Menu:** Choose between
Chicken Marsala
~or~
Wild Mushroom & Asparagus Risotto

**Price:**

| | |
|---|---|
| SEAW Members | $30.00 |
| Non-Members | $35.00 |
| Students (with ID) | $15.00 |
| Unemployed, current members | $15.00 |
| Late Registration, add | $5.00 |

**Reservation Deadline: Wednesday, April 22**

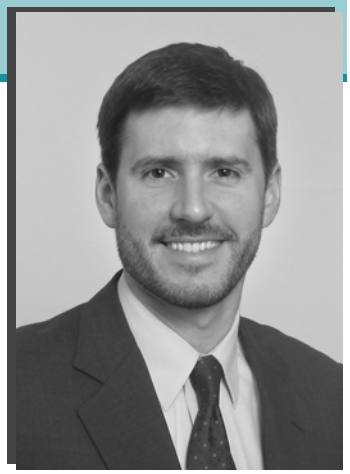
**Register Online at www.seaw.org**
**(Members, be sure to log in to get member price.)**

**Or email seaw@seaw.org**

**Prepayment is Requested**

# FROM THE BOARD: EXTEND YOURSELF

## Reaching out to the next generation of engineers and SEAW leadership



When I graduated from high school, the keynote speaker handed out a little paper card that had two words written on it. Those two words were "Extend Yourself." He encouraged us to carry it with us, take it out now and then and think about what it meant. I tucked it into the inner pocket of my wallet and have carried it around to this day. I can't remember the speaker's name or occupation, but the legacy of the message he handed out that day lives on, with me at least.

The dialogue of "identifying the problem" continues to confront us everywhere we turn – in the professional world, health care, the economy, education, the environment...this list goes on. In the case of the structural engineering profession, the concern that continues to surface is the competence of the younger engineers. I still don't see enough action being taken to address this situation. We need to start focusing on what we are going to do to address this disparity, and begin to take steps to put a plan in motion.

The setting for crafting this column is somewhat fitting as I am typing this about halfway over the Pacific Ocean on my way to Australia to assist with a massive design-build tunneling project that is currently underway in Brisbane. Imagine turning up on a project you know next to nothing about, except for the fact that it is seriously behind schedule, several tougher parts of the design have not been started, and the team is looking to you to help figure out how to get the job done!

A long time friend of mine who is originally from Scotland recently commented to me about how Americans have been looked to as the ones to "make it happen" or "pull it all together"...maybe this was because we originally needed somewhat of a pioneering spirit just to survive as we expanded westward into the undeveloped wilderness over 100 years ago. Some of this pioneering spirit was instrumental in the development of state-of-the-art engineering materials like prestressed concrete.

In any case, here I find myself being pulled into a situation that is difficult to describe unless you are physically experiencing it. Imagine an entire office floor with around 150 engineers, drafters, managers and administrative staff all working on ONE project—and they are falling behind.

Am I bringing the "pioneering spirit" to help save the day? Who knows? Perhaps. What I can say is that the project is struggling because it lacks engineers with the experience, practical skills and ability to make tough design decisions and drive the process forward.

So, in light of these observations, some humble thoughts as we forge ahead back here at home:

**To the Project Managers, Principals and Senior Engineers** – encourage junior staff to take on challenging roles that may seem over their heads. Support them but don't micromanage. A lesson learned on your own (provided it doesn't jeopardize the outcome of a project or relationship with a client) will be many times more powerful for the individual compared to guidance in a controlled environment. The trick is finding the balance that works successfully for both sides!

Show your junior engineers you are interested in their welfare and give them the opportunity for professional development. Assign tasks and delegate the authority to accomplish these tasks to promote mutual confidence and respect between both parties. This also encourages the junior engineers to exercise initiative and to give wholehearted cooperation in the accomplishment of their tasks.

Focus on specific learning examples rather than a general overview of multiple issues. Strive to make that connection on a given task so that a solid foundation of experience is laid for the individual to spring from. Take time to engage your junior staff and discuss how to approach new situations and what it takes to succeed in these situations. "Extend yourself" to the junior staff by mentoring them and giving them more responsibility.

**To the Junior Engineers** – get involved in professional societies and seek a leadership or committee position. This will expand your horizons and add depth and perspective to your toolbox of skills that you apply on a daily basis. It will make you more sought after and a more valuable employee/engineer. You have to take charge of your own destiny. If you do not take action or risks, you have no grounds to complain if you find yourself in an unsatisfying role within your profession. Consider the old adage "nothing ventured, nothing gained."

Jump at the opportunity to work outside of your office, city, state or country. Working on the Brisbane Airport Link tunnel for me has been like being on a project that is on fast forward play—the same amount of experience in a fraction of the time. Get into positions where YOU are solely responsible for your own success or failure. Leave the safety net once in awhile and "extend yourself"...

I obviously don't have all the answers and can only share what has worked for me over the years. I've made the effort to push myself out of my comfort zone and it has been by and large a positive experience. I think the significance of volunteer/instructional/leadership activities outside of our daily jobs is highly underrated. These activities add perspective and round out other non-technical skills that are hard to come by in the day-to-day professional environment.

So, think about how you can "extend yourself" in your own capacity to improve the situation around you. Whether you are just starting out on your career path, looking to transition the ownership or leadership of your firm, or looking for ways to improve the profession, the action required to make these things happen depends on you.

Andrew McGlenn
Chapter Vice-President
mcglenn@jacobssf.com

The SEAW Seattle Chapter *Equilibrium* is published monthly from September through May and is available online at www.seaw.org.

Articles, letters, and announcements are accepted by e-mail to seaw@seaw.org.

**Advertising rates (prepaid)** Help Wanted/Job wanted, max 200 words, $65; Display ads: Quarter page, $115; Half Page, $150; Full Page $190; inserts, pre-printed 8 1/2 X 11 inch flat, $190. 10% discount for ads running two or more months. Deadline is the fourth Friday of the month. Contact SEAW for an advertising order form.

# Northwest Conference Recap

The 2009 SEA Northwest conference was held at the Hotel Murano in downtown Tacoma September 24 and 25. The theme for the conference was "History and Destiny", with many of the programs alluding to Tacoma, the City of Destiny, in some manner. SEA members from Oregon, Idaho, British Columbia, and Washington were in attendance, along with 26 Exhibitor/Vendors.

The program was kicked off Thursday with a lunch and a welcome by Tacoma Mayor Bill Baarsma. Mayor Baarsma gave an enlightening talk on Tacoma's past and the impressive redevelopment of the City, particularly the downtown area.

The technical sessions began after lunch with Seattle Chapter's Ed Huston illuminating presentation on the ICC Code Change Process, along with the significant code changes that are now part of the 2009 IBC. SEAW is an extremely active and well-known participant in Code Change development, and Ed expertly presented the procedures necessary to effect such changes. Ed also summarized the significant changes in the 2009 IBC, including an added Section in IBC Chapter 16 for a new simplified wind analysis procedure similar to the 1997 UBC. This new procedure was initiated and became part of the 2009 UBC due to the efforts by the SEAs of Washington, Oregon, and California.

Next Seattle Chapter's Peter Somers covered existing buildings and the International Existing Building Code (IEBC). Thanks in part to SEAW's Existing Building Committee; this third edition of the IEBC has now reached a level of maturity that is relatively consistent, understandable, and useable. Chapter 34 of the 2009 UBC has been significantly revised, and now explicitly permits the IEBC as a "deemed to comply" alternative which in turn references ASCE 31 and ASCE 41 as compliance documents. Peter's presentation also focused on situations which could trigger various seismic upgrades of existing buildings.

*Conference attendees listen to Michael Sullivan's Thursday evening talk*

Next SEAO's Jake Stept gave a presentation on the Expansion of the Shriner's Hospital for Children in Portland, Oregon. Jake's talk covered many of the cost and schedule considerations for this non-profit hospital addition, which resulted in spanning an existing parking structure with story deep steel trusses to structurally accommodate the new addition.

During the afternoon the Exhibitor/Vendor Tradeshow was made available at no cost to all SEA members and other interested individuals. The exhibitors appreciated the increased participation resulting in discussions about their various products and services with all in attendance.

Thursday's dinner featured an entertaining presentation by Michael Sullivan on the Development and Engineering of the City of Destiny. Sullivan gave a fascinating slide show on the early history of Tacoma, and the prominent role its engineering, design, and buildings played in the development of the Pacific Northwest.

Dr. Subhash Goel, Professor Emeritus of Civil Engineering at the University of Michigan, was the keynote speaker at the conference. Dr. Goel's presentation Friday morning involved a recently-developed design methodology on Performance-Based Plastic Design of Earthquake-Resistant Structures. This procedure uses preselected drift and yield mechanisms as key performance criteria with this direct design technique.

Friday afternoon's presentations included the "Sea-To-Sky Highway Improvement Project" by Shaun Valdovinos of the SEA BC Chapter. Shaun showcased the construction of several bridges with unusual site challenges on this highway widening project for the 2010 Winter Olympics. The last presentation Friday afternoon was on "Sustainability and Structure" by Steve Benner from the SEA Idaho Chapter. Steve emphasized that although the

*(Continued on page 4)*

# October Mini-Seminar

**Don't miss the Mini-Seminar preceding the October meeting!**

**When:** Tuesday, October 27, 5:15 PM

**Where:** McCormick & Schmick's Harborside

**Topic:** Essential Technologies for Structural Monitoring

Whether you are a civil or structural engineer, consultant, or supplier, you understand that the safety and daily operation of critical civil infrastructure is essential. With access to diagnostic tools for remote monitoring, sensors, data-logging tools, and signal processing equipment, structural engineers are better able to monitor the health of these civil structures. The input gathered from these platforms can be used to maintain or restore the system capability for projects that include refurbishment, repair, corrosion mitigation, structural testing and monitoring, analysis, or reliability.

Learn about commercial-off-the-shelf technologies used for structural monitoring including sensors, data acquisition (digitization), data communications and architectures. We will discuss buses and networks including distributed and wireless scenarios. The presentation will conclude with several case study examples of deployments for laboratory/research systems, portable/field data acquisition and remote monitoring.

**About the Presenter**

Christoph Wimmer, Regional Program Manager for National Instruments Embedded and Control Accounts, specializes in the areas of advanced feedback control; system simulation in research modeling; control design and implementation; and control system validation and testing. Additionally, he closely follows industry trends and is constantly looking for ways to help clients reduce time to market for new products and replace aging equipment by leveraging the latest technologies. He is also a member of the IEEE Industry Applications Society and an active participant and speaker within the Association of Energy Engineers and holds a master's degree in electrical engineering.

# NW Conference & Tradeshow

*(Continued from page 3)*

LEED checklist appears to have few opportunities for structural engineers to directly influence sustainable design, it is extremely important for our profession to understand and embrace this truly integrated design process with other consultants to best achieve the primary objective of minimizing the negative effects of buildings on our environment.

Mark your calendar for next year's Western States Roundup, scheduled for October 14 and 15 at Whistler, BC. The conference will be the first to be hosted by our neighbors to the north, SEA of BC, and will be held in conjunction with the Canadian Association of Professional Engineers and Geoscientists Conference, with SEA Chapters in Hawaii, Arizona and Utah participating along with SEAW, SEA of Idaho and SEA Oregon.

*-Northwest Conference and Tradeshow articles contributed by Scott Douglas,.*

## Tradeshow Acknowledgements

The following exhibitors participated in the Northwest Conference and Tradeshow in Tacoma. Their participation helped offset the cost of the conference, and SEAW, along with the other participating SEAs would like to thank them for their participation.

- ASC Steel Deck (steel roof and floor deck)
- Basalite (one of our local CMU plants)
- Canam Group (open web steel joist and structural steel fabrication)
- CRSI (Concrete Reinforcing Steel Institute)
- Epic Metals Corporation (floor and roof deck)
- Galvanizers Company
- Hardy Frames (steel frames in light framed construction)
- Hilti (concrete anchors)
- ICC (International Code Council)
- iLevel by Weyerhaeuser (engineered wood products)
- Leewens Corporation (concrete coatings, linings, and repair services)
- Light Weight Steel Frames, Ltd (cold formed steel products)
- LP Building Products (engineered wood products)
- PACO Steel and Engineering (steel columns, beams, and moment frames)
- PTC, Inc (Post tensioned cables)
- Powers Fasteners (concrete anchors)
- Propex Concrete Systems (fiber reinforced concrete systems)
- RedBuilt (formerly I-Level Commercial Division)
- Reprographics Northwest LLC
- Side Plate Systems, Inc. (steel moment frame connections)
- Simpson Strong-Tie (connectors for light framed construction and concrete anchors)
- Star Seismic LLC (buckling restrained braced frames)
- Taylor Devices Inc. (seismic damping systems)
- T-OZ Construction, Inc. (foundation systems)
- Web Joist (pre-engineered wood products)
- Worthington Integrated Building Systems (multi-story cold form steel framing)

# YMF Corner

The YMF held a Happy Hour in Bellevue at Chantanee Thai on September 16th. There were 17 younger members in attendance as well as the Seattle Chapter Past President Scott Douglas and the Disaster Preparedness Committee Chair Paul Brallier. The Seattle Chapter Board asked the YMF to brainstorm ideas for Mini-Seminar topics for future dinner meetings. This was the topic of discussion for the Happy Hour. If you have any Mini-Seminar topics, feel free to email them to me.

The next YMF Happy Hour will be October 13th at the Pike Place Brewery at 5:00 pm. The topic of this month's Happy Hour will be the upcoming PE and SE exams. There will be licensed engineers at the Happy Hour to answer any last-minute questions you have. Of course, they can't tell you what is on the test, but can offer advice on things like test-taking strategies, last-minute test preparation, or give you a boost of confidence to settle your test anxiety. Those who aren't taking an exam may be interested in discussing the upcoming changes to the SE exam format.

Created in 2007, the Younger Member Forum provides networking and social opportunities to SEAW members 35 and under, as well as new non-member engineers and students. All SEAW members are welcome to participate in YMF functions.

### NUCOR TOUR

The YMF has planned a tour of the Seattle Nucor Steel Mill (2424 SW Andover Street, Seattle Washington 98106). The Seattle mill is currently operating three days a week, Saturday thru Monday. They roll 1"x1" up to 4"x4" angles, 3" to 6"channels, 1.5" to 6" flat bars, 0.5" to 3" round bar, and #3 through #18 rebar. Nucor operates a single, highly-efficient arc furnace capable of producing 795,000 tons of raw steel per year. The temperature of the furnace needed to change scrap into low grade steel is in excess of 3,000 degrees Fahrenheit! Steel is formed into billets which pass through a series of rolls to reduce and shape them into the finished shape. When the billets pass through the final rollers, they can reach speeds of over 3,000 ft/min.

The tour will be October 12th at 5:00pm, led by a mechanical engineer at Nucor, Pat Jablonski. The size of the tour is limited to 12; keeping the group small ensures everyone can see and hear the tour guide. Sign-up is on a first-come, first-served basis. An email invitation was sent October 1st to the YMF email list. If you want to participate in the tour, please email me to see if there's still space. Otherwise, if you or someone you know would like to be added to the YMF email distribution list, please send me a request.

**LATE-BREAKING NEWS:** A second Nucor tour has been arranged for **Monday, October 26th.** Email me to sign up on a first-come, first-served basis.

Jessica Jenness, YMF Chair
jessicajenness@hotmail.com

# Meetings, Seminars, Announcements

## Seattle Chapter Firms Showcase Coming in November Register Your Firm Today!

Our November SEAW dinner meeting will feature the fourth annual program by Seattle University and University of Washington students and Seattle Chapter's Younger Members. The meeting will take place on Tuesday, November 17th at the University of Washington Waterfront Activities Center.

### Firms Showcase

Our usual pre-meeting Mini-Seminar will be replaced with a Firms Showcase networking event from 5:00 pm to 6:30 pm, tailored to introduce attendees to a variety of structural design firms in the Seattle area. This event is intended to (1) promote SEAW and the structural engineering profession, (2) provide information to students in particular about the typical projects and activities of the Seattle area's design firms, and (3) answer questions from any of the attendees. This is not intended to be a recruiting event, but rather an opportunity for SEAW members and their firms to showcase their profession.

Due to space limitations we must limit the showcase to 10 firms, which are being accepted on a first-come-first-served basis. First priority will be given to firms that responded last year but were not included due to the space limitation. Second priority will go to firms not represented at last year's showcase.

There will be a $200 sponsorship fee per table to reduce the cost of this event and assist in funding other student and Young Member Forum activities.

Format: Each participating firm is limited to two representatives with 8-1/2 x 11 handout material. An identifying sign no larger than 11x17 should be provided that can be attached to the table. This is intended to be a casual event where each firm can provide information about themselves and the profession to the younger (and older) members and students. The handout material should feature project information, but can include firm profiles, contact information, etc. No big flashy boards are allowed.

Please email seaw@seaw.org by Wednesday, November 4th if you are interested in having a table at this event. We are working with the students at SU and UW as well as the Younger Member Forum, and should have a good turnout for this event. The dinner meeting program will include presentations from UW and SU students.

Don't forget —this is a first-come-first-served opportunity. Secure your spot as soon as possible by e-mailing seaw@seaw.org

## COSMOS Technical Session Nov 6 in Milbrae CA

The Consortium of Organizations for Strong Motion Observation Systems (COSMOS) will be holding its Annual Meeting and Technical Session at the Clarion Hotel at the San Francisco Airport, Millbrae, California on Friday, November 6th. The day-long technical session will focus on "Practical Application of the new ASCE 7-10 Required Procedures for Determining Site Specific Ground Motions." This year's COSMOS Technical Session is being co-sponsored by the Pacific Earthquake Engineering Research Center (PEER) and the California Geological Survey (CGS).

This year's COSMOS Technical Session is complimentary to the September 2009 EERI "NGA Model" Seminar program. For complete program and registration details for the COSMOS Annual Meeting and Technical Session, visit the COSMOS website at www.cosmos-eq.org.

## Revit Structure Knowledge Community Forming

Have you ever wanted to be a part of a Revit Structure knowledge community specific to Seattle?

We are organizing a Seattle Revit Structure Organization (SeaR-SO) that focuses exclusively on structural issues. The number of Revit Structure users in this city have reached a critical mass; we all could really benefit from a peer group devoted to the discussion of the program. Our goal is to create a knowledge community of Revit Structure users of all skill levels; this will be a place to share information and to seek and offer support with the common goal of advancing the practice of Revit Structure.

We plan to hold monthly forums where members can meet to discuss Revit Structure topics and maybe exhibit their own projects. Longer-range goals include the creation of central website that includes a calendar of events and an online forum.

If interested, please email Irina Wong at iwong@degenkolb.com to be added to the mailing list so we can notify you of the inaugural SeaR-SO meeting.

Please pass this information along to other users who may be interested. Revit Structure users at all skill levels are welcome. . . no experience necessary!

## PSEC Seeks Speakers for Career Day Events

The Pugest Sound Engineers Council (PSEC) has distribution lists (organized by county) of local engineers willing to talk about engineering to high school & middle school students during the school day. This is usually part of a school's Career Day event.

We need to have a few more volunteers for Snohomish County, since that area has been getting more requests lately. We are always eager to have additional volunteers for both King & Pierce Counties too.

Here is the current process:

The school teacher (or guidance counselor) contacts the PSEC Speakers Coordinator (currently, Steve Snelling) and asks PSEC to provide a daytime classroom speaker.

Then the Speakers Coordinator forwards the school's request on to the distribution list for that county.

A speaker is assigned on a first-come first-serve basis. The speaker volunteer then coordinates directly with the representative from the school.

Speaker volunteers that are not available for that day – don't even need to reply – since we are only looking for someone who can accommodate the event.

A volunteer can ask to have their name removed from the speakers list at any time (due to workload or other commitments, etc.)—no questions asked. At the beginning of each school year—we ask if they want to continue to be a volunteer speaker.

We also provide some sample PowerPoint presentations to all the engineer volunteers. These general engineering presentations can easily be personalized for each speaker's background. Sometimes the school will have the speaker give the same presentation to 3 or 4 classes throughout the day.

If you're interested in volunteering, please contact Steve Snelling at

CareerDayVolunteers@pseconline.org
or by direct e-mail:
stephen.r.snelling@boeing.com

STRUCTURAL ENGINEERS ASSOCIATION
of WASHINGTON • Seattle Chapter
PO Box 44 • Olympia WA 98507 • 206/682-6026 • www.seaw.org



# Membership

## Accepted Applications

**Michael G Hough**
Associate

**Drew A. Kirkpatrick**
Associate

**Benjamin Klingenstein**
Associate

**Rylan Knuttgen**
Associate

**Benjamin J McCann**
Professional Associate

**Eric Rupp**
Professional Associate

**Ryan Jeffrey Walters**
Associate

## Membership Applications

**Kyle Glen**
**JMN Consulting Engineers**
**BS ARCE 2005,**
**Cal Poly San Luis Obispo**
**Class: Associate**

**88%**

of Seattle Chapter Members have paid their dues.

*HAVE YOU?*

# Seeking Member Input

**Take a moment to email us and let us know how the online Equilibrium works for you. Do you read it online or print it out? Do you have suggestions for improving content or presentation?**

**EMAIL US AT seaw@seaw.org TODAY!**

# SEAW Membership Dues

### HAVE YOU PAID YOUR 2009 DUES?

Seattle Chapter members were emailed their dues invoices on January 23rd, and reminders went out on March 2nd, April 1st, August 11 and by mail on October 1st... According to the SEAW Bylaws, annual dues are payable in advance. **Members whose dues are unpaid at the end of the year will be removed from the membership. Check your dues status today!**

### Online Invoice Check/Dues Payment Instructions

1. Go to www.seaw.org
2. Log in to the member area (Default login name is your email address; password is your first name.
3. Click on "My Membership" in the menu bar
4. Select "Membership Renewal" in the gray menu bar to see if there is an outstanding invoice.
5. Select the invoice and Follow the prompts to pay your dues online using your VISA or Mastercard.
6. When your payment has been made, you will receive an automated receipt by email.

Forgot your Login Information? Simply click on "Forgot Password" under the Member sign in area and enter your email address. Your information will be emailed to you.