



EQUILIBRIUM

Newsletter of the Seattle Chapter
Structural Engineers Association of Washington

December 2011

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SEAW Strategic Planning Meeting Held

On Saturday, November 19th, twenty state-wide SEAW leaders convened in Seattle for a one-day strategic planning workshop. Donna Cameron with Melby, Cameron & Anderson served as a facilitator and will prepare a final written report in collaboration with Luke Heath, SEAW State President. The retreat participants represented a broad range of SEAW leaders and stakeholders. The representatives included those from the state board, the four chapter boards, several committee chairs and two leaders from the Seattle Chapter YMF.

Donna had prepared the group in advance of the planning session by sharing the results of the leader and member survey, which many of you had filled out. In total, 245 people responded to the survey for a response rate of 27.6%. Some survey questions elicited as many as 165 comments and the total survey results filled over 50 pages!

Donna began the workshop on a positive note by sharing her opinion that the SEAW is healthy and has a well-engaged membership. Frequently she is brought in to cure an ailment within a member organization, but she did not sense any major ills within SEAW. She did state that effective organizations will begin their future planning well before negative signs appear. This set the stage regarding the importance of the strategic planning effort and to give direction for the future years.

An important aspect of planning involves crafting a common future vision that helps steer the course of an organization. A vision statement differs from the mission statement in the sense that the latter defines the reason for

existence. SEAW has a strong mission statement and the group agreed it only requires a few editorial-type updates. For the rest of the morning, Donna facilitated a discussion related to the vision of SEAW in 2022.

To conclude the morning session, the SEAW leaders identified five major goal areas that must be addressed in the next year or two in order to advance the organization towards its future vision: membership, continuing education, committee functionality, public outreach, and organizational structure. These five areas were the focus of breakout group discussions that began the afternoon session with each breakout group identifying strategies and tactics for implementation. As each group shared their ideas with the larger group, Donna recorded the responses that will be integrated ultimately into the SEAW strategic plan. Luke and the chapter presidents will be sharing key results from the membership survey along with the strategic plan contents with the membership in future articles and meetings.



Strategic planners from left: Chun Lau, Ed Huston, Facilitator Donna Cameron, Mark D'Amato, Mike Wright, Mike Bramhall, Andrew Boileau, Lynnell Brunswig, Luke Heath, Cale Ash, Tom Corcoran, Peter Somers, Jill Shuttleworth, John Tawresey, Anna Troeh, Ted Smith, Bill Whipkey, Brian Pavlovec, Howard Burton, John Tate

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No December Meeting

January 24 Seattle Chapter
Dinner Meeting:

Dr. Charles Roeder

AISC T.R. Higgins Lecture

"Gusset Plate Connections
for Seismic Design"

*To you and yours —
Happy Holidays from SEAW!*

From the Board: Structural Engineering & the Holidays

-by Mike Bramhall

Greetings from the SEAW Seattle Chapter Board of Directors. As the end of the year approaches (yet again; how did that happen?), many of us begin to get drawn into the inevitable cyclone of activity that is the holiday season. Some approach this with excitement, some with trepidation, and some with dogged determination to outdo what we accomplished the year before (or vow not to repeat what we did the year before). As engineers, we are trained to identify challenges and address them. The holiday season is a prime time to draw on our problem-solving abilities to make the season more enjoyable and less chaotic for all.

As a result, we have dug through the vast SEAW Newsletter archives (actually, Lynnell did) and dredged up this past "From the Board" message describing what it means to be an engineer during the holidays; showing that there are many features of this time of year where our rigorous training and logical process can be most useful to those around us.

Probably the most critical impact a structural engineer can have during the holiday season is associated with the Christmas tree. While the whole family should be involved in the selection of the ideal tree, specification of the correct selection criteria is vague, at best, and the subsequent understanding by the remainder of the family can be difficult. Obtaining a tree with the proper conical surface area and appropriate branch density and distribution is critical so that the appearance of the tree is not too bulky and not too thin. That being said, once the tree has been selected by the four-year old, with complete disregard for the aforementioned selection criteria, it must be successfully transported home with, hopefully,

limited damage to the car and minimal amount of pitch, needles and water deposited on or within.

The all-important process of mounting the tree is next. This is where our dedication to the noble profession of structural engineering is most valuable. Not only are we trained to understand the importance of proper vertical alignment for gravity loads and elimination of P-delta effects but also we are acutely aware of the importance of the connection to the ridiculously inadequate green and red metal tree stand. It is with this expertise that I can step away from the tree, after jockeying with the hopelessly wimpy bolts on the tree stand, to expertly advise the rest of my family to not touch the tree under any circumstance lest they disturb the delicate 1.001:1 safety factor against overturning.

The next momentous step in the transformation to a Christmas tree is the installation of the lights. While this step can be undertaken with a minimal structural engineering background, a healthy dose of mathematics is helpful in determining how many strings of lights are required to create the proper illumination and light pattern. If you want to see people's eyes glaze over almost instantly, try explaining the impact that the varying radius of the conical shape of the tree has on light density at the top and bottom of the tree.

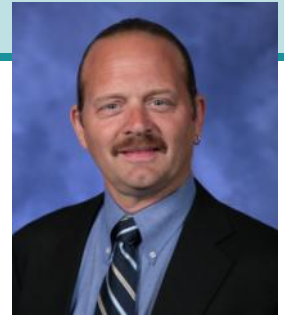
Finally, having completed this step, my work is substantially complete and the rest of my family can carry out the final process of decorating with glass balls, tinsel, family ornaments, and other oddities such as crocheted Oreo cookies and the jeweled egg with my picture from the second grade. This is much like our roles during the construction administration phase of our projects

where the structure is done and all that remains is the innocuous architectural stuff.

Stringing the house for the exterior lights is also a crucial piece in achieving a true holiday atmosphere. As structural engineers, we are gifted with an intrinsic understanding of the importance of dimensions, proportion and symmetry. It is with this background that I take out my trusty tape measure to determine the length of each light string. A quick sketch of the roof edges, including rough dimensions, allows for a determination of the ideal arrangement along the edges of the house to create a sensible and complete pattern. I have, however, been informed (by none other than my wife) that this is ridiculously retentive and that I will be the only one to notice. I counter by stressing that my engineering training has taught me the importance of early planning prior to climbing out on the roof in the wind and rain with a jumble of 150 lights. After all, what would OSHA say?

One mystery during the holidays is the variable volume characteristics of the family station wagon during "the road trip to the relatives". This is particularly true if overnight stays are involved. Perhaps the phenomenon is similar to soils excavation where we are only able to achieve 95% compaction when placing the fill material. Good thing we have soft sided (i.e., malleable) luggage.

A couple of years ago I was particularly grateful when our sons had grown up enough to eliminate the need for diapers and the vast array of stuff that seems to go along with them. Unfortunately, I had erroneously allowed myself to believe that, finally, we could drive to Grandma's house and be able to see out the rear window of the car. Ha, not so-because as the diaper bags, strollers and



car seats begin to disappear, the toys grow in quantity and size. Who knew that a stuffed walrus and a binkey would transform into ten Power Ranger action figures, five large dinosaurs, two scooters and a soccer ball? Do we really need to take all that? Anyway, that doesn't even touch the space required for the presents.

Thankfully, the structural engineering profession encourages the ability to think three-dimensionally, and our structural observation experience during construction administration teaches us how to cram the proverbial five pound bag.

My family's recent trip to the Oregon coast to visit relatives required a mere 15 minutes of precision packing to maintain visibility. The return trip, however, required at least twice as much time and some inventive space saving techniques such as letting the air out of the soccer ball (why did we bring that, anyway?) and stuffing shoes under the seats.

I hope you have enjoyed this light-hearted excursion into the importance of structural engineering expertise for a successful holiday season. These are just a few examples of how we, as structural engineers, can improve the holiday experience for those around us.

On behalf of the board of the Seattle Chapter of the Structural Engineers Association of Washington, I wish you all a happy holiday season and a prosperous New Year.

Company Spotlight: PCS Structural Solutions

PCS Structural Solutions, founded over 40 years ago, is a single-discipline structural engineering firm with focused expertise on engineering for buildings. With 40 talented employees, we work on projects throughout the United States and Canada. Our expertise spans a multitude of project and building types, including educational, healthcare, civic and residential.

Our Seattle office is celebrating 15 years, and our Tacoma office recently relocated into a new LEED Platinum office building—the first in the Northwest and only one of a handful in the country.

PCS has always been on the cutting edge of innovation and technology as we patented the Truncated X Coupling Beam, which can significantly increase construction speed and performance in high rise core wall buildings. We have been leaders in integrated project delivery methods for over a decade and are a recognized national leader in BIM.

Our average staff tenure is 15 years which exemplifies our commitment to our company culture. PCS has been honored to be in Structural Engineering & Design's "Top 10 Best Structural Engineering Firms to Work for" the last six years and our staff are members of national industry committees including SEAW's Wind committee, SEI-CASE's Building Information Modeling committee, and ACI's Performance Based Design and Parking Structures committees. PCS has been a long time supporter of SEAW and all current engineering staff are members. Luke Heath is the standing SEAW State President and Jeff Klein is the SW Chapter President; two positions of many that PCS staff have held.

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206/292-5076
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Cale Ash, SEAW Member since 2005, is our Company Spotlight Coordinator. If you would like to see your company in the spotlight, e-mail Cale at cash@degenkolb.com.

PROJECTS

Seattle Children's Bellevue Clinic and Surgery Center Bellevue, Washington

This facility is a new 200,000 SF campus consisting of an ambulatory surgery center, MOB, and parking garage completely designed in BIM (Building Information Modeling) using IPD (Integrated Project Delivery). This LEED Gold project exemplifies the commitment of the owner, architect, and general contractor to utilize Integrated Project Delivery (IPD) and Continuous Project Improvement (CPI) to shave three months, 30,000 sf, and \$20 million off the initial project estimates. PCS is currently working on seven hospital campuses.



-Image courtesy of PCS Structural Solutions

Raisbeck Aviation High School, Burien, Washington

The 86,000 SF three story high school and mechanical penthouse is located on the Museum of Flight campus. This innovative school prepares students in fields of aviation, aerospace and related disciplines through highly interactive, project-based learning. The building structure consists of three levels of steel-framed construction with composite decking. The program requirements for this high-tech learning center necessitated a structural framing scheme that allowed for future flexibility. Large open spaces that are provided by the clear span castellated beams offer gathering and multi-use learning areas. The exposed framing also provides a learning experience to enhance the engineering and design curriculum. The sweeping curves of the roof reflect the aviation theme while affording a practical enclosure and screening for rooftop mechanical systems.



-Image courtesy of PCS Structural Solutions

Montecito Residence, California

PCS has designed private residences all over the world including the Montecito Residence, a single-family home set in California's fire prone Toro Canyon. The house is made of simple, fire-resistant material such as steel, glass, and concrete. This residence was one of 66 distinguished buildings to win the 2008 Chicago Athenaeum's American Architecture Awards, an Award of Honor at the AIA Pacific Region 2008 Design Awards, an Honorable Mention in the Custom Home category of the Sunset-AIA Western Home Awards, and was featured on the World Architecture News website.



-Image courtesy of Tim Bies/Olson Kundig Architects

YMF Corner

Habitat for Humanity

-by Jennifer Ahlport

On Saturday, November 12, 10 members of SEAW's Younger Members Forum braved the cold and the rain to volunteer with Habitat for Humanity. Abhineet Gupta, Anna Troeh, Bryon Perry, Don Nguyen, Jenny Ahlport, Krzysztof Zaleski, Marne Zahner, Matias Rudback, and Paul Mockus showed up to help make affordable low-income housing possible. For the past several years, YMF has been involved with the Rainier Vista site; there are a total of twelve houses expected out of this development and YMF worked on the last three.

A large portion of our work consisted of helping with the site organization. There's limited room on the job site, and it's necessary to keep everything organized. Shortly before our volunteer build day, the foundation walls were poured on one of the last buildings, and the formwork was stripped. Unfortunately, this created a large amount of plywood and other lumber that needed to be cleaned up and organized. During the stripping process, all the lum-

ber was put into piles that were in the way for future work. We learned all sorts of inventive ways to move sheets of plywood from one side of the job site to the other. After all, what are engineers if not inventors? In addition to the site organization, some people also helped out with the building itself. The foundations were recently poured, and before the dirt was backfilled, the foundation drainage needed to be put in place. Rocks were needed to protect this system before backfilling. Overall, we were able to see that there is a lot more work that goes into building a house than just the part with the hammer and nails.

In addition to the heavy lifting, we took a break midday for lunch. At the recommendation of a fellow Habitat volunteer, instead of our usual Subway lunch, we tried out an Italian bakery. I think everyone was enamored with the new lunch location, especially the giant cookies and other baked goods.

We will be having another Habitat Build Day in the spring. If you are interested in being added to the email list requesting volunteers, please email me at jahlport@degenkolb.com or seawymf@gmail.com.



In order (left-right): Jenny Ahlport, Matias Rudback, Anna Troeh, Paul Mockus, Jerry Lee, Byron Perry, Marne Zahner, Krzysztof Zaleski, Don Nguyen, Abhineet Gupta

Upcoming YMF Events

- | | |
|--------|--|
| Dec 13 | Happy Hour, 5:00 PM
Alibi Room |
| Jan 10 | Happy Hour, 5:00 PM
Dragonfish |
| Jan 18 | Happy Hour, 5:00 PM
520 Bar & Grill |

Meeting Recap

Bill & Melinda Gates Foundation

-by Charlene Hails

Hans-Erik Blomgren of Arup was the key speaker at November's dinner meeting. Blomgren was a lead structural engineer for the new Bill & Melinda Gates Foundation campus in Seattle, Washington. The project is the world's largest to have been awarded LEED Platinum certification. Design was completed using Revit software, which allowed integration of all disciplines within a single model. The drawing set spanned 11 volumes.

The project area covers 12 acres and encompasses 900,000 square feet. Phase I was completed this spring and includes parking below grade, an atrium, reception center, and two boomerang-shaped office buildings. A second phase is planned for the northeast corner of the site. The campus is 40% vegetated, including two acres of living roofs and native plants.

The project was constrained by many factors including sewers, utilities, and contaminated soils. The site had been home to a bus depot, and the soils contained benzene and hydrocarbons. Some of the contaminated soil was removed but

"Liquid Boot" and a water barrier system were also used to isolate pollutants. The excavated soil was removed to Oregon where it capped another contaminated site.

Excavation for the parking garage commenced in August 2008. The garage is a continuous structure below grade with no expansion joints. Concrete cores for the two office buildings were poured in mid-2009, with steel erection topping out about a year later. The Foundation moved in this past May.

Cantilevered framing over breezeway consisted of tapered steel members designed so that each of the 395 pieces of steel could be used twice. This measure not only saved money, but allowed for a thinner floor plate at the building's edge.

The atrium includes a cable net wall system to provide transparency. The wall consists of 30-millimeter diameter stainless steel cables in tension. The 60-foot-tall building columns carry compression loads up to 350 kips to balance the wall tension. Designers chose to use 10-inch-diameter inside 14-inch-diameter steel columns.

- continued on Page 5

YMF Leadership

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Jennifer Ahlport
Jahlport@degenkolb.com

Social Representative:

Anna Troeh
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Past Chair:

Dan Yeager
dyeager@dc-engineers.com

Outreach Representative:

Eric Pope
pope.eric.w@gmail.com

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.

News of Note

Ed Huston Receives Robert Cornforth Award

SEAW Seattle Chapter member Ed Huston was recognized at the National Council of Structural Engineers Association's annual conference award banquet in Oklahoma City last month when he was presented with the NCSEA Robert Cornforth award. This award is presented to an individual for exceptional dedication and exemplary service to a Member Organization and to the structural engineering profession overall.

Ed has been extremely active in SEAW over the years. He served as the SEAW State President in 1989 and has been the Exam Committee Chair for over 25 years, working with the State Licensing Board on the state-specific

structural exam. He has also been active in NCSEA, joining the Board of Directors in 2004 and ending his term in 2009 as NCSEA Past President. Ed presently serves NCSEA on the Licensing Committee and has been Chair of the Code Advisory Committee's General Requirements Subcommittee since 2004.

In 2009, Ed became Chair of the New Member organization Committee. He also received the NCSEA service award last year and was awarded the prestigious James Delahay Award in 2009. With the Robert Cornforth award this year, Ed is the first engineer to receive all three NCSEA special awards in the organization's history. Congratulations to Ed for such an accomplishment!



Ed Huston receives the Cornforth award from NCSEA President Jim Malley

Japan Earthquake Reconnaissance Report Now Online

In May 2011 SEAW formed a reconnaissance team of engineers to observe and evaluate damage caused by the March 11th Great East Japan earthquake and tsunami. The team traveled to the metropolitan cities of Tokyo and Sendai, and along the Tohoku coast to observe the impacted areas. The team also met with Japanese earthquake research organizations, design and construc-

tion professionals, and public officials to learn more about the extent of the damage and standard design practices in Japan.

The team's findings, originally presented at their June 15th briefing at the University of Washington, can now be accessed online at <http://www.seaw.org/documents/SEAWJapanEQReport.pdf>.

Meeting Recap

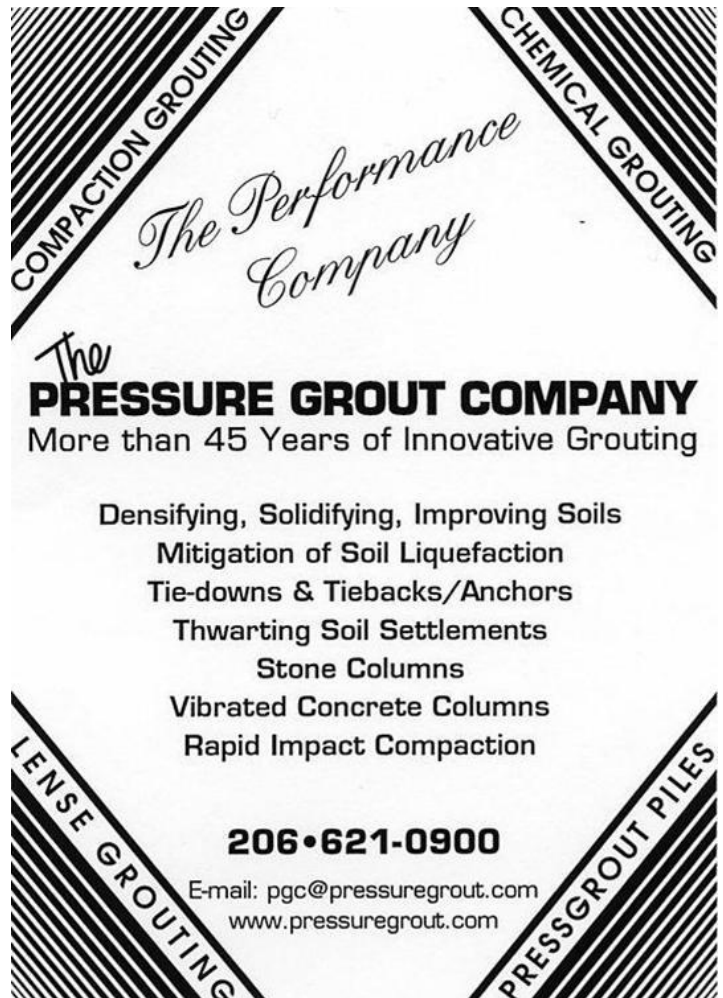
continued from Page 4

P-delta effects were important, and interaction diagrams similar to those used in concrete design were developed.

Sustainability was an important aspect of the project. Water collected from non-green areas, non-copper roofs, plaza surfaces, and chiller condensate is stored in a million-gallon rain-water harvesting tank and used for irrigation, water features, and toilets. Chilled water for daytime cooling is generated

overnight during off-peak consumption hours. Heat exchangers are used more than chillers. Chillers are air cooled to save water.

One question posed at the end of the presentation was whether the buildings were the most expensive ever designed in Seattle, for which Blomgren had no answer. Where long-term sustainability is considered, however, economic cost becomes less relevant compared to the environmental costs we all pay.



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News of Note

Report: NCSEA Annual Conference

- by Chun Lau

The National Council of Structural Engineers Associations (NCSEA) hosted its 19th annual conference in Oklahoma City, Oklahoma this past October. Chun Lau attended the event as SEAW's state delegate with Jill Shuttleworth attending as state board delegate. SEAW was well represented with the following members in attendance: Mark D'Amato, Ed Huston (NCSEA Past President), Greg Schindler (NCSEA Past President) and Jennifer Ahlport (YMF). The conference had a great turnout of vendor exhibitors, which helped to make it a financial success.

NCSEA continues to grow and gain national prominence and recognition through the ongoing hard work of its many vital committees, board members, monthly *Structure* magazine publication, and supporting state member organizations (MO). The annual business meeting was held Saturday; it began with a roll call and a brief report from each state's MO. The NCSEA committee chairs then presented reports on their committees' activities and accomplishments. The licensing committee has been encouraging MOs across the country to work with their licensing boards to move toward a separate licensing of structural engineers. A vote was taken regarding the proposed NCSEA policy statement for separate structural engineering licensure, which was published in the October 2011 issue of *Structure* magazine. The vote was unanimous in support of the policy statement.

The continuing education committee reported they will continue to work with Kaplan Architecture and Engineering to provide the 16-hour SE exam refresher course. The publication committee reported that, over the past year, they have completed a third book titled *Inspection, Testing, and Monitoring of Buildings and Bridges*. Several national experts from across the United States have contributed chapters to this practical guide for examining damaged structures or structures that appear to be failing. Final editing of the document will take up to six months according to ICC. The book should appear in mid-2012. A fourth publication on the analysis, design, and detailing of sheet pile wall systems is approximately 85% complete. This document should be finished in mid-2012.

The Executive Director of NCSEA, Jeanne Vogelzang, presented her report, giving the attendees a perspective of the history of NCSEA, providing background on the beginnings of the organization (19

state representatives in 1993) to its current standing (43 Member Organizations).

The staff has grown from a part-time executive director and part time administrative assistant to the current staff of executive director, two administrative assistants, continuing education director, meeting/marketing/SEC coordinator, and contracted accountant with an annual budget of \$890,000. The budget was presented by the NCSEA Treasurer with the following breakdown: 54% staff wages and benefits, 16% office costs, 13% NCSEA committees and board expenses, 10% annual meetings, and 7% continued education costs. Member dues account for approximately 20% of the NCSEA budget; the majority of the income is derived from NCSEA webinars, publications, advertising in *Structure* magazine, and SECB certifications.

The conference ended with the Saturday Evening Reception and "Excellence in Structural Engineering" Awards Banquet. SEAW's own Ed Huston was presented with the NCSEA Robert Cornforth Award; this



award is presented to an individual for exceptional dedication and exemplary service to a Member Organization and to the structural engineering profession overall. SEAW member Mark D'Amato was elected and installed to the Board of Directors and will serve on the Board for a two-year term. Congratulations to Ed and Mark for their achievements!

Don't miss next year's NCSEA Winter Institute, in New Orleans, Louisiana February 10-12, 2012. The two-day event is entitled "Soft Soil—Water and Wind" and provides continuing education credits. Additional information regarding next year's Winter Institute and other NCSEA-sponsored events, including webinars and seminars, can be found at www.ncsea.com.

NCSEA welcomes volunteers who are willing to actively serve to promote the cause of structural engineering by committee participation. If you are interested in getting involved with an NCSEA committee, go to www.ncsea.com for more information. All volunteers are welcome.



LICENSURE POLICY APPROVED BY NCSEA

During the NCSEA 19th Annual Conference, held in Oklahoma City, October 20-22, the Member Organization Representatives in attendance discussed and unanimously approved the NCSEA policy on Separate Structural Engineering Licensure. The policy encourages all jurisdiction to adopt legislation that defines the practice of structural engineering and restricts it to those who have demonstrated competence by licensure as a structural engineer. The policy supports the use of the NCEES 16-hour examination and the NCEES Model Law Structural Engineer as the basis for licensure of Structural Engineers. Within the Policy, NCSEA also encourages equitable transitioning of engineers currently practicing structural engineering.

Meetings, Seminars, Announcements

Structural Masonry Design Webinar

The Northwest Concrete Masonry Association will be conducting a three-session webinar focusing on the design of reinforced concrete masonry construction. Both working stress and strength design methods of the 2009 IBC and 2008 MSJC codes will be covered.

The updated webinar will cover design examples of masonry building elements by manual and automated methods. It is aimed at practicing engineers who want to learn how to design masonry in a practical and efficient manner. Continuing education credit (up to 7.5 PDH) can be earned. Certificates of attendance will be issued.

The webinar dates are: **December 6th and December 8th**. Each session will run from 4:00 to 6:00 pm Pacific Time. Additional information can be obtained from the Northwest Concrete Masonry Association at 425.697.5298 or www.nwcma.org.

ASCE Seattle Section Geotechnical Group Dinner Meeting

Thursday, December 15, 2011
5:30 to 8:30 PM at the Bellevue Red Lion Hotel
Topic: U-215 I-5 Undercrossing Construction Pits

Sound Transit's expansion of the light rail system from downtown Seattle to the University of Washington includes twin tunnels crossing underneath I-5. To keep the tunnels at a workable depth, the vertical alignment takes them through the I-5 cylinder pile foundations. As the tunnel boring machine is not able to mine through reinforced concrete and steel beams, these obstacles had to be removed prior to the tunneling operation. Four pits up to 63-feet deep, 2 on either side of I-5, were excavated to allow for both the construction of new foundation structures and the

demolition of the conflicting cylinder piles. Construction activities included the installation of cylinder pile walls and tie-back anchors, removal of existing pipe piles, excavation of the pits, construction of the reinforced concrete pit walls, demolition of the existing piles and backfilling of the pits. Due to concerns with potential movement of the existing structures, an automatic geotechnical monitoring system was installed and utilized throughout the construction. The speaker will review the construction of this project, as well as discuss the unexpected wall and wall backfill movements.

RSVP by December 13. Details and reservation information at: www.seattlegeotech.org

ASCE's Pacific Northwest Regional Conference (PNWRC)

Engineering students from around the region participate in this annual event, which features various presentations and competitions, most notably, the Steel Bridge and Concrete Canoe competitions. The 38th annual conference will be held April 26 to 28, 2012 here in Seattle and co-hosted by both Seattle University and the University of Washington. Winners of this competition then go on to compete at the National Conference, which will be held June 14 to 16, 2012 at the University of Nevada, Reno.

Currently, UW and SU are in fundraising mode for the event. Their projected costs are around \$60,000, which will

cover facility rentals, equipment, food, awards, and various other necessities. Sponsorship offers companies a great opportunity to gain exposure to students, as contributions are acknowledged through various means of marketing based on contribution level. For more information or to make a contribution, please contact Fundraising Co-Chairs Fawm Saefong tinysfong2000@yahoo.com or Sherry Kim kimsherr@uw.edu.

Judges and volunteers will also be needed for the conference. If you're interested in helping out, please contact Volunteer Coordinator Amanda Neice at amanda.neice@gmail.com or Judges Coordinator Nina Mao ninamqx@gmail.com.

Committee News

From the Professional Practices Committee: Slabs and Puddled Columns

How do engineers specify and show the slab-column intersection of different strength concrete on their drawings? The usual situation is that column strengths are larger than slab strengths. This comes about from the desire for structural engineers to minimize column sizes in highrise buildings. Increasing the design concrete strength of columns anywhere from 5-ksi to 8-ksi, or higher is an economically efficient way of accomplishing this. However, you'll want to avoid specifying that grade of concrete everywhere, i.e. the floor slabs. "Puddling" the column concrete in the slab over a radius around the column is one approach. Regarding this issue, here is the response of one firm as to their "standard practice" for this occurrence:

"Our policy is to note puddling requirements in our column schedules to improve visibility. Graphically, we like to diagram the full height of columns over the height of a single sheet, depending on the size of the

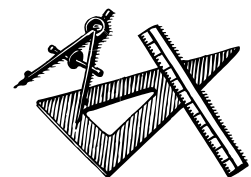
building. The note is placed in the zone where extra high-strength concrete is required in the columns. The note just calls out "puddling required in 4.5-foot radius zone around column" at each floor level in this zone. It is the opinion of our designers that puddling is a subtle code requirement and that the contractor would not know about this unless told explicitly.

"The current code trigger for this is when the column strength is more than 1.4 x the strength of the slab/beam system. So for a 4 ksi slab, you could go to 5.6 ksi columns before needing to puddle, and so on. But in reality our slab strengths come back at an average of 1-ksi greater than what's called for (usually because of the high-early mix designs). If ever a puddling note were to be omitted on the plans and you were using a 5-ksi slab, a common strength for our office, 5-ksi would allow

for up to 7-ksi columns, but considering test results (probably achieving 6-ksi), you could reasonably argue for as much as 8.4-ksi in columns. That would probably cover the majority of cases where this problem occurs; the problem being that a puddling requirement was missed during construction.

"Finally, on most of our projects, it appears when puddling is explained to contractors, they elect to raise the strength level of the slabs to within 1.4 x that of the columns rather than puddle. The issue goes away."

If you have any questions or comments of your own that you want to share, please write to Equilibrium and reference this article.



Opportunities

Senior & Staff Level Engineer



A progressive transportation consulting company has immediate openings for structural engineers at Senior and Staff Levels in its Bellevue Branch.

Senior Level Structural Engineer—MS degree or higher in structural engineering, WA SE License and a minimum of 15 years of progressive structural engineering experience associated with transportation projects is required. Successful candidate will have strong project management skills, communication skills, and structural design capabilities, especially in the seismic arena, such that he/ she will be able to lead a team to provide construction documents.

Staff Level Structural Engineer – MS degree or higher in struc-

tural engineering, EIT License and a minimum of 2 years of structural engineering experience in the field of transportation project design is required. Successful candidate will have strong structural design experience and the ability to work as a team member to provide construction documents.

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*Electronic resume to:
sfarbood@trantecheng.com*

2011 Seattle Chapter Unpaid Members

The following members show in our records as being unpaid for 2011. Members whose dues are unpaid at the end of the year are removed from the membership. Please contact the SEAW office if you feel an error has been made.

Josh Brown
James Chen
Chris Covington
Richard Dethlefs
Hien Duong
Kerry Everton
Youssef (Joe) Ferzli
Ella Garber
Jordan Hague
Taesan Hose
Michael Neale Huggins
Cary Kopczynski
Anne Krauser
Paul Larson
Martin Maingot
James Maras
Chad McDonald
Robert McNiesh
Mahvash Nassiri
Joshua Nelson
Vu-Hoang Nguyen
Leilani OConnor
Brian Olmsted

Dylan Parker
Robert Raichle
Sri Rajah
Clemens Russell
Kyle Rumble
Eric Rupp
Patrick Ryan
Lavina Sadhwani
William (Bill) Sandbo
Christi Schwend
Jean Spangler Shortreed
Kathrina Simonen
Kenneth Simons
Ken Smolarek
James Stephens
Robert Stevens
Gary Swenson
Matt Toton
Narong Trongtham
Andy Tu
Mark Uchimura
Hayden Watson
Andree Yen



Brown and Caldwell is a privately owned and employee held environmental engineering consulting firm that has been providing municipalities, private businesses and government agencies with sustainable environmental solutions for more than 60 years.

Entry-Level Structural Engineer

Currently our Seattle office has an exciting opportunity for an Entry-Level Structural Engineer (0-5 years experience) to join our Structural Design Group. The candidate will work with structural, mechanical, process and electrical engineers and designers on designs for facilities primarily serving the water and wastewater industries. Project work includes structural detailed design on small to large projects in Washington, Idaho, Oregon, Hawaii and Guam. Responsibilities include design of tanks and basins per ACI 350; design of concrete, steel, masonry and wood facilities and structures per IBC; seismic design and evaluations using IBC, ASCE, and ATC

documents; design of monorails and crane runway beams; prepare detailed design sketches, or work directly within CAD or Revit Structure, and coordinate with CAD drafting staff to prepare 3-D models and design drawings; provide construction support; and utilize RISA 3D, Enercalc and other software for structural design.

B.S. and M.S. in Civil Engineering with an emphasis in structural coursework required. EIT preferred. Effective oral and written communication is essential.

We offer a competitive salary and benefits package. Please visit our Web site at <http://tbe.taleo.net/NA9/ats/careers/requisition.jsp?org=BROWNCALDWELL&cws=1&rid=720> to apply online for job code 720. We value workforce diversity. EOE/AA

Senior-Level Structural Engineer

Currently our Seattle office has an exciting opportunity for a Senior-Level Structural Engineer to join our Structural Design Group. The candidate will work with structural, mechani-

cal, process and electrical engineers and designers on designs for facilities primarily serving the water and wastewater industries for municipal, industrial, and federal clients. Project work includes leading the structural design effort on small to large projects in Washington, Idaho, Oregon, Hawaii and Guam. Responsibilities include design of tanks and basins per ACI 350; design of concrete, steel, masonry and wood facilities and structures per IBC; seismic design and evaluations using IBC, ASCE, and ATC documents; design of monorails and crane runway beams; develop structural scope and engineering estimates for projects; provide construction support; utilize RISA 3D, Enercalc and other software for structural design; and contribute to company standard detail and specification updates.

B.S. and M.S. in Civil Engineering (structural emphasis) and a minimum of 8 years of experience in structural engineering

design required. WA SE license or the ability to obtain quickly through comity required. Ability to obtain SE for OR, HI, and Guam (requires passing 16-hour structural exams recognized by western states) preferred. Candidate should have comprehensive knowledge of concrete, steel, masonry and wood structural design per IBC and referenced codes. Structural design experience with wastewater treatment plant or industrial facilities preferred. Seismic design experience required. Experience coordinating with staff performing 3-D CAD or Revit Structure is a plus. We offer a competitive salary and benefits package. Please visit our Web site at <http://tbe.taleo.net/NA9/ats/careers/requisition.jsp?org=BROWNCALDWELL&cws=1&rid=722> to apply online for job code 722. We value workforce diversity. EEO/AA



STRUCTURAL ENGINEERS ASSOCIATION of WASHINGTON • Seattle Chapter

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Seattle Chapter Committees & Chairs

House/Program	Peter Opsahl/Cale Ash
Refresher Course	Mark Moorlegghen
Membership	Cheryl Burwell
Newsletter	Lynnell Brunswig
Presentations/Awards	Howard Burton
Engineer of the Year	Ed Huston
Governance	Howard Burton
Committee Oversight	Tom Corcoran
YMF	Natalie Low

Statewide Committees & Chairs

Code Advisory	John Hooper
Earthquake Engineering	Tom Xia
Building Engineering	Scott Beard
Existing Buildings	Peter Somers
Professional Practices	John Tawresey
Wind Engineering	open
Exam Liaison	Ed Huston

Scholarship	Bill Mooseker
Legislation	open
Education	Mike Wright (interim)
Finance & Auditing	Ted Smith
Disaster Prep/Response	Paul Brallier
Public Information	Cale Ash
Sustainability	Marjorie Lund
Snow Load	John Tate
SEAW Historian	Don Northey

For Committee contact information, visit www.seaw.org and click the Committee page

SEAW Calendar

DECEMBER, 2011

Tuesday	13th	YMF Happy Hour, 5:00 PM Alibi Room, Seattle, WA
Tuesday	13th	Seattle Chapter Board Meeting
Tuesday	20th	January Newsletter Deadline
Saturday	31st	Deadline for 2011 Membership Dues Unpaid Members Deleted
*****		Scholarship applications solicited

JANUARY, 2012

*****		2012 Dues Statements Go Out
Tuesday	10th	YMF Happy Hour, 5:00 PM Dragonfish, Seattle, WA
Wed	18th	YMF Happy Hour, 5:00 PM 520 Bar & Grill, Bellevue
Friday	20th	February Newsletter Deadline
Tuesday	24th	Seattle Chapter Dinner Meeting Election of Nominating Committee Seattle Chapter Dinner Meeting
Friday	27th	SEAW State Board Meeting

Membership

Membership Applications

Hans-Erik Blomgren

Arup
PS Physics, 1995, North Park Univeristy
MS S.Eng., 1997, U of Minnesota
Licensed SE, Washington
Class: Member SE

Kyle Holman

DCI Engineers Inc
BS 2009, Washington State University
MS 2010 Washington State University
Class: Associate

Kenneth Kvalheim

EISI Consulting Engineers
BSCE 1979, University of Washington
Licensed PE, Washington
Class: Member PE

James Mahoney

Magnusson Klemencic Associates
BS 2007, Brown University
MS 2008, University of Illinois
Class: Associate

Applications Accepted

Tyler Kurz, Associate
Patrick Lindblom, Associate
Tony Nguyen, Student

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. 10% discount for ads running two or more months. Deadline is the 20th of the month. Contact SEAW for an advertising order form or visit www.seaw.org/resources_newsletter.cfm

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Are Your 2011 Dues Paid? Names of unpaid members are listed on page 8

INSTRUCTIONS FOR PAYING YOUR DUES ONLINE:

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