From the Board: Being “In the Know”

One of the nice things about being on the SEAW board is being ‘in the know’ about a lot of things happening in SEAW and in the region. I’ve been participating in the statewide membership taskforce for the last few months. The membership taskforce’s goal is to not only keep our membership numbers increasing, but also to keep the membership informed about all the benefits of SEAW membership. This made me think about all the personal benefits I have gotten out of my SEAW membership over the years.

Eight years ago I had my PE and had just stopped working full time to start a family. I had been attending Seattle dinner meetings and contributing to the newsletter for a couple years at this point, but I was at a crossroads in my career. I needed to take a step back and would only be working intermittently on out-of-state projects. What was the best way to stay involved in the local culture? I knew that keeping in contact with the engineers I had met and worked with was just as important as keeping up with code changes in order to maintain the investment in my career.

SEAW provided so many of these opportunities for me: I continued to attend the Seattle dinner meetings to maintain relationships and keep informed on industry trends; I went to seminars to keep up on code updates so I wouldn’t fall behind technically; I went to the refresher course so I could get my SE license; I read the newsletter which informed me on all of the above as well as the state of the local job market with a quick check on the classified section. Sure, there was more that I had to do, but SEAW made it so much easier to keep my foot in the Seattle structural engineering door.

Now I’ve got a bigger family, a bigger business, and am more involved in SEAW than ever. Working by myself, I use SEAW as a resource in different ways than engineers who work at a large or medium size firm would, but that’s one of the great things about SEAW: it has something for everyone. It has networking opportunities, it has educational opportunities. You can just read the newsletter, or you can chair a committee. You can teach and you can learn. It’s more than just a job, it’s more than a profession; it’s part of being a community.

I hope you all have had a chance to get your own benefits out of SEAW. If you haven’t, think about what you’d like to get out of it. The board is always open to suggestions. And if you have gotten something out of your membership, please encourage your co-workers and fellow engineers who aren’t members to join and become part of the community.

Karen Damianick, PE, SE owns KLD Engineering and has been a board member for about a year. Her daughter turns 8 on Christmas Eve and her son will be 4 by time this newsletter is published. She can be reached at kld@kldengineering.com

Happy Holidays to you all from SEAW!
Is Your Roof Ready for Solar?

- by Owen Kohashi

The 2012 Seattle Energy Code (SEC) was amended in September 2013 to include provisions for Solar-Ready Buildings. It contains a new “solar readiness” requirement for low-rise non-residential buildings that requires areas be designated and designed for installation of future photovoltaic (PV) and solar water heating (SWH) systems and related infrastructure.

The rule applies for most new non-residential buildings of five stories or fewer in the City of Seattle, and requires an unobstructed solar zone of either 40 percent of the building’s roof area, or an area large enough to generate 20 percent of the building’s electricity, whichever is less. If you’re working on a building of this type, you should be aware of this requirement and should also confirm that the architect is aware of the requirements of SEC C410.2. The full text is available at the Department of Planning & Development website at: http://tinyurl.com/DPDCodeUpdate.

The SEAW Sustainability Committee had some input into the section of the SEC that specifies the structural requirements, which reads as follows:

C410.2.7 Structural integrity. If the solar zone is on the roof of the building or another structure on the site, the as-designed dead load and live load for the solar zone shall be clearly marked on the record drawings, and shall accommodate future PV or SHW arrays at an assumed dead load of 5 pounds per square foot in addition to other required live and dead loads. For PV systems, a location for future inverters shall be designated either within or adjacent to the solar zone, with a minimum area of 2 square feet for each 1000 square feet of solar zone area, and shall accommodate an assumed dead load of 175 pounds per square foot. Where PV or SWH systems are installed in the solar zone, structural analysis shall be based upon calculated loads, not upon these assumed loads.

Once the area of the solar zone is determined by others on the design team, you will need to design the designated roof areas for the additional dead loads to accommodate a future installation of solar panels. The purpose of these additional loads is to make the installation of the solar system easier in the future by making the roof more robust, but this doesn’t guarantee that modifications will not be required. When the actual installation is to take place, the last sentence in section C410.2.7 requires that a structural analysis be performed that calculates the gravity, wind, and seismic loads on the system to be installed, and evaluates and retrofits the existing structure as needed. Note that the weights of currently available systems vary significantly, and 5 psf is on the very low side of the range. The DPD assumed that solar panel systems will continue to get lighter in the future, and wanted to specify a load that would minimize the economic impact to new projects.

So what if you’re actually designing a roof with PV panels on it, not just accommodating future installations? The ASCE 7 does not provide detailed guidance on how to determine design wind and seismic loads on rooftop PV systems, and attempting to determine a reasonable methodology on your own could be daunting. However, the Structural Engineers Association of California (SEAOC) has published two reports that provide guidelines for seismic and wind design of rooftop PV systems: PV1-2012, “Structural Seismic Requirements for Rooftop Solar Photovoltaic Arrays,” and PV1-2012, “Wind Design for Low-Profile Solar Photovoltaic Arrays on Flat Roofs.” These are available for purchase on the SEAOC website in the Technical Publications Bookstore. While these reports have not been adopted or endorsed by the Seattle DPD, they provide a design methodology from a recognized source and should assist you in the permit review process.

Similar provisions for solar-ready roofs have been proposed for future versions of the Washington Building Code and International Building Code. The SEAW Sustainability Committee will monitor the progress of these proposals and will inform you if anything develops.

Owen Kohashi is a Senior Civil Engineer with Seattle City Light. A licensed structural engineer in Washington, Owen has been a member of SEAW since 1996, and an active participant on the Sustainability Committee.

SEFW Holds Another Successful Fall Forum

The Seattle Chapter skipped is normal dinner meeting in November in order to support the Structural Engineers Foundation of Washington’s third annual Fall Forum, held on November 21 at Benaroya Hall. The evening began with a pre-function reception where SEAW members were able to mingle and network with other professionals in our industry.

The main lecture, entitled “Tall Wood: How Timber Suddenly Decided to Grow Up,” was presented by Michael Green, Principal with Michael Green Architecture, and Eric Karsh, Structural Engineer and Principal with Equilibrium Consulting. Michael and Eric shared the stage in a casual, back-and-forth presentation covering their many years of collaboration and current projects using timber as the primary structural and architectural system.

Wood has a long history as a building material that is both sustainable and long-lasting, as historic churches and temples from Europe to Japan can attest. They traced the recent history of timber, from post-and-beam systems of the past couple centuries to the stick-framed systems commonly used today, to the future of wood, taking advantage of new technology and fabrication processes to extend the possibilities for this ancient material.

Many of their collaborations have focused on Cross-Laminated Timber (CLT) structures using panelized systems. Picture a multi-story tilt-up building with CLT panels for the walls and floors. CLT, developed in Switzerland in the early 1990’s, consists of multiple layers of wood, with each layer oriented crosswise to the next. It provides increased dimensional stability and strength, and can be used for relatively long spans in floors, roofs, and walls. In addition, CLT is a highly sustainable and carbon-friendly material, offering carbon-storage instead of the carbon-emitting by-products of other building materials.

Michael and Eric presented several recent projects using timber structural systems. These range from large commercial and institutional projects such as airports, municipal halls, and university buildings. With careful attention to detail, the exposed wood structures become a key component of the architecture, creating warm and vibrant spaces.

Pushing the limits of wood technology and building code parameters, this duo has designed wood structures up to 10 stories and has conceptual designs for buildings of about twice that height. Wood, which Michael Green calls “the most technologically advanced material grown by the sun,” is poised to make a major impact in the architectural and structural designs of the next decade.

SEFW sends is appreciation and thanks to the Platinum Sponsors: Coffman Engineers, KPFF Consulting Engineers, and Magnusson Klemencic Associates; Gold Sponsors: Cary Kopczynski & Company, Coughlin Porter Lundeen, and DCI Engineers; the Silver and Bronze Sponsors, and all of the SEAW members who continue to provide support for the SEFW and the Fall Forum.
Hello fellow structural engineers.

Welcome to a new section in the Equilibrium. This section is intended to be a devoted to the observations and musings of our membership during our travels. It is intended to be an open forum for all members to contribute. Travelling to Europe? Take notes and tell us. Going to Brazil for World Cup 2014? Share the experience.

So, how many of you have been accused of being engineerds? Looking at the “wrong” things during your travels? Staring at beam-column connections rather than the artwork on the wall? Wondering why they put a shear wall in the middle of the room when no one around you seems to notice? It is an affliction I am happy to admit I suffer from.

Recently, I had the opportunity to visit the Georgia Aquarium in Atlanta. I find aquariums to be especially interesting buildings and facilities because of the blend of varying uses, users, and occupants. We generally spend most of our professional lives trying to avoid the effects of water and here is a structure devoted to containing it. Then there are the users and occupants. Water dwelling creatures can’t be more different than us; they move differently, they breathe differently, and they live in an environment that is very difficult to observe them without affecting their behavior. The Georgia Aquarium does a fantastic job of showcasing the animals in their natural environment. This is especially true of their Ocean Voyager exhibit. This is a tank that holds almost 6.5 million gallons of water. This is over 840,000 cubic feet of water! In this tank alone, there are several thousand fish from about 50 species. This included four mantas at about 8 to 9 feet across and two whale sharks about 20 to 25 feet long.

There is an acrylic tunnel through the tank that allows you to view the fish from the side and as they swim by overhead. This is especially noteworthy when one of the whale sharks or mantas swims over your head. But what I found to be the highlight of the visit was the window in the Viewing Theater. The window measures about 60 long and almost 25 feet tall! Talk about hydrostatic pressure! I did not get any photos when I was there but you can see the viewing area on the Aquarium’s website, www.georgiaaquarium.org. The next time you are in Atlanta, I would suggest a visit to the Georgia Aquarium; you won’t be disappointed. Oh yeah, and the animals are interesting, too.

Michael Bramhall is Senior Forensic Engineer with Case Forensics Corporation. A member of SEAW since 1995, Mike currently serves on the Seattle Chapter Board of Directors.

In Memoriam

C. Adrian Arnold

Honorary Member 1993
SEAW President 1977
SEAW Seattle President 1975
April 14, 1931 to November 20, 2013

The son of engineer and SEAW founder Cecil A. Arnold, C. Adrian Arnold graduated from Roosevelt High School in 1949. He attended Washington State University, earning a BS degree in Civil and Structural Engineering. He went on to earn the MBA from Stanford University.

To begin his career, he joined his father at Arnold, Arnold & Associates, Consulting Engineers, based in Seattle. They built many waterfront ferry terminals in the Puget Sound area. In 1991 the firm merged with Andersen Bjornstad Kane Jacobs (ABKJ), where Adrian served as Senior Principal and Vice President, heading a bridges and waterfront structural design team. He retired in 2000.

The May 1972 edition of the ASCE Journal of the Waterways, Harbors and Coastal Engineering Division includes his article “Multipurpose Land-Water Transfer Facility,” describing the design solution for a facility with a diversity of functional requirements, owned by the Port of Seattle and located at Pier 48, with its principal user the Alaska Ferry System.

He served SEAW Seattle as President in 1975, and as SEAW President in 1977, becoming an Honorary Member in 1993. ACEC honored him as a Regular Fellow.

Adrian is survived by his wife of 49 years, Helen Rohacek Arnold; son and daughter-in-law Schuyler and Catherine Irby Arnold; daughter and son-in-law Jenny and Brent Diaz; grandchildren Reese, Bailey and James Arnold; Brendan and Taylor Diaz, along with many nieces, nephews and cousins.

Complete obituary and guestbook online at http://funerals.coop/c-adrian-arnold/.

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.

Except where noted, opinions expressed in this newsletter reflect those of the author and do not reflect or represent the position of SEAW. Portions of this newsletter may be reproduced provided credit is given.
Free Design and Engineering Support for Wood Buildings

TECHNICAL SUPPORT – Free one-on-one project support from experts in wood design—email help@woodworks.org

ONLINE TRAINING – Webinars, design examples, case studies

WEB-BASED TOOLS – CAD/REVIT details, calculators, span tables, product and design guides

EDUCATIONAL EVENTS – Wood Solutions Fairs, workshops, in-house presentations

WoodWorks

Wood costs less and delivers more

WoodWorks is an initiative of the Wood Products Council
Meetings, Seminars and Announcements

Serviceability: Your Input Needed

The ASCE 7 General Structural Requirements Subcommittee is conducting a survey on serviceability design practice and requirements, and they would like the input of as many practicing structural engineers as possible. SEA members nationwide are invited to read the linked white paper on serviceability and then fill out and submit this brief online survey.

Thank you,
Thomas A. DiBlasi, PE, SECB Chair, NCSEA Code Advisory Committee

Museum of History & Industry Presents Civil Engineers that Built Seattle

The Museum of History & Industry (MOHAI) is proud to showcase the exhibition Civil Engineers that Built Seattle from November 23, 2013 through January 1, 2014. Developed by the American Society of Civil Engineers (ASCE), the Civil Engineers that Built Seattle exhibition is a panel display exploring the story of civil engineering projects, policies, and the people that were essential and transformative to the development of the Puget Sound region. Featuring milestones in Northwest civil engineering, the exhibit gives visitors the opportunity to learn about the creation of several regional engineering landmarks and the people who made them possible, including:

- Snoqualmie Falls Power-Generation Station
- Lacey V Murrow (I-90) Floating Bridge and Mount Baker Tunnels
- George Vancouver’s Mapping of the West Coast of North America

Civil Engineers that Built Seattle will be on display in MOHAI’s Linda and Ted Johnson Family Community Gallery from November 23, 2013 to January 1, 2014.

MOHAI is dedicated to enriching lives through preserving, sharing, and teaching the diverse history of Seattle, the Puget Sound region, and the nation. As the largest private heritage organization in the State of Washington, the museum engages communities through interactive exhibits, online resources, and award-winning public and youth education programs. For more information about MOHAI, please visit www.mohai.org or call (206) 324-1126.

2014 Engineering Fair: A Free Event Open to the Public; Special Activities for Kids K-12

Sponsored by the Puget Sound Engineering Council
Saturday, February 8, 2014
10:00 AM – 4:00 PM
Museum of Flight Side Gallery, 9014 E Marginal Way South, Seattle
(Separate paid admission for access to the Museum of Flight is available but not required.)

The Engineering Fair is an annual event that is part of National Engineers Week, February 16 through 22, 2014. Engineering societies and colleges from around the Puget Sound will be available to talk about what engineers do. Engineering societies to be represented include aerospace, civil, electrical, industrial, manufacturing, mechanical, military, quality, welding, and more.

Visit www.pseconline.org for more information on the Engineering Fair.

Seattle Chapter Firms Showcase at January Meeting: Now Accepting Table Reservations

Tuesday, January 28, will mark our sixth Seattle Chapter Younger Member Forum program featuring a Firms Showcase and Student Project Showcase. The meeting will take place at the University of Washington Waterfront Activities Center.

Our meeting will kick off with the popular Firms Showcase networking event from 5:00 pm to 6:30 pm. The showcase is an opportunity 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.

Due to space limitations we must limit the showcase to 10 tables, which will be reserved on a first-come-first-served basis. Firms have an option to reserve a full table for a sponsorship fee of $200, or a half table for $100. This is an opportunity for owners/employees of smaller firms to team up with a colleague and split a table. Your sponsorship fee will enable students to attend free of charge.

Each participating firm is limited to two representatives (one rep for half-tables) 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.

If you’re interested in having a table at this event, email seaw@seaw.org by Friday, December 20. This is a first-come, first-served opportunity. Secure your spot soon!

Structures Congress Scholarship Opportunity for Younger Members (35 and younger)

Applications due December 13

SEI is committed to the future of structural engineering and offers a scholarship for Young Professionals (age 35 and under) to attend the Structures Congress, April 3 to 5, 2014 in Boston. Many young professionals have found Structures Congress to be a career-changing and energizing experience, opening up networking opportunities and expanding horizons to new and emerging trends. Click here for details and to apply online.

# Steel Sheet Piling – Design

**Friday, December 13, 2013 – Silver Cloud Stadium Hotel – Seattle, WA**

The Engineering Group at Skyline Steel is proud to present this complimentary, non-commercial seminar. This event is specifically designed for contractors, and civil, structural, geotechnical engineers and academics. We have partnered with industry professionals to provide the most current information available today. A certificate for 3 PDHs* (pending PIE approval) will be awarded to attendees. Don’t miss this great opportunity to network with other industry professionals, while obtaining professional development hours.

## Agenda

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<tr>
<th>Time</th>
<th>Activity</th>
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<tr>
<td>7:50am – 8:15am</td>
<td>Registration</td>
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| 8:15am - 8:20am | Welcoming Remarks & Speaker Introduction  
Don Tylenda, Business Development Mgr., Skyline Steel |
| 8:20am – 8:35am | Innovative & Accelerated Applications for Permanent  
Sheet Pile Structures  
Erynnne Bell, Business Development Associate EIT,  
Skyline Steel |
| 8:40am – 9:40am | Designing Sheet Pile Walls  
Geotechnical & Structural Analysis, Sheet Pile Selection Criteria &  
Designing for Construction  
Kurt Levens, P.E., Engineering Supervisor, Skyline Steel |
| 9:45am – 10:15am | Case Study - Green River Levee Improvement Program  
Strengthening Horsehoe Bend, Benting & braces  
DeHartene Levee  
Ken Langholz, P.E., Design Engineering Mgr., City of Kent |
| 10:15am – 10:35am | Coffee Break                                                            |
| 10:40am – 11:30am | Designing Sheet Piling Anchorage Systems  
Typical anchoring arrangements for steel pile retaining walls  
including high modulus walls and cocrip walls  
Colin Jacobs, BSc. PhD, Director UK, Anker Schroeder |
| 11:35am – 12:15pm | Sheet Pile Installation  
Discuss various vibratory, variable moment & impact equipment.  
Introduce new noise & vibration reduced pile technology  
Mike Carter, P.E., Blue Iron Foundation and Shoring, LLC |
| 12:20pm – 12:50pm | Lunch                                                                   |
| 12:50pm – 1:30pm | Case Study – Home Plate Class A Retail & Office Complex  
First in Seattle designed with permanent exposed AZ Sheet pile walls for underground car park  
Mark D’Amato, S.E., DCI Engineers |
| 1:40pm | Site Tour: Home Plate Class A Retail Office Complex  
View permanent steel walls of underground car park facility (Walk To Site – 1 Block) |

* Must be present to be eligible

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[www.skylinesteel.com](http://www.skylinesteel.com) | 888.450.4330

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**Location:**  
Silver Cloud – Stadium Hotel  
1046 First Avenue South  
Seattle, WA 98134  
Tel: (206) 204-9800  
**Free valet parking!**
The SEAW Committee Corner is dedicated to promoting greater communication between the membership and committees, and to encourage all SEAW members to become active participants in the committee(s) of their choice. Many committees are now using GoToMeeting web-conferencing software to facilitate remote attendance at meetings. Ask the committee chair for details.

Disaster Prep/Response
Our next meeting will be:
December 17, 2013, 12:00-1:00 (plus)

Quantum Engineers
Topics:  SAP Evaluator/ATC-20 Classes, February and March (in Seattle)
Plan A: Statewide post-disaster volunteers program
Plan B: Registry and Deployment
Contact: Joyce Lem, Joyce.Lem@hdrinc.com

Committee Info:
During the first half of 2014, the State Emergency Management Division will hold meetings regarding a statewide program for emergency response volunteers (SAP Evaluators/ATC-20 trained). The Seattle Disaster Prep/Response (DPRC) looks forward to participating.

There’s lots to do, and news members are always welcome.

Earthquake Engineering
There will be no meeting in December.
Our next meeting will be:
January 7, 2014, 12:15 pm-1:30 pm
Westlake Office Tower, 1601 Fifth Ave,
Contact: Andy Taylor, Chair, andrew.taylor@kpff.com

Education
Our next meeting will be:
Thursday, Jan. 7, 2014, 12:15 pm -1:15 pm
Seattle Municipal Tower, 700 5th Ave, Room 2170
Contact: Ardel Jala, Ardel.jala@seattle.gov
Adam Theiss, Atheiss@mka.com

Legislative
Meeting Date: TBD
Meeting Time: TBD
Location: Telephone/GoToMeeting.
Topic: Current issues and topics in Olympia
Committee Info:
This committee is the voice of SEAW in Olympia and it brings legislative issues that may be important/impactful to the members of SEAW.
My goal is to get at least one member from each chapter on to this committee.
Contact: Tim Nordstrom, timn@starseismic.net

Sustainability
Our next meeting will be:
January 22, 2014, 12:00-1:00 pm
Degenkolb, 600 University St., Ste 720
Topic: Wrap-up of past speakers
Contact: Adam Silvers, adam.silvers@kpff.com

Committee Info:
Our meeting will wrap-up our series of meetings from the fall on the sustainability of cross-laminated timber and wood design. We will have discussion that will cover all of the talks and propose items for action.

SEAW Committee Chairs

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Structural Engineers Foundation  
Howard Burton  
206.343.3000  
hburton@seattlestructural.com

W/A Seismic Safety Committee  
Stacy Bartoletti  
415.392.6952  
sbartoletti@degenkolb.com
SEAW Calendar

December, 2013

****** Scholarship Applications Solicited
Tuesday 10th YMF Happy Hour, 5:00-7:00 pm Metropolitan Grill
TBD Seattle Chapter Board Meeting
Friday 20th January Newsletter Deadline

January, 2014

****** Dues Invoiced-Pay by January 31!
Monday 20th February Newsletter Deadline
Tuesday 28th Seattle Chapter Board Meeting
Seattle Chapter Dinner Meeting
Student/Firms showcase at UW WAC
*election of nominating committee
Friday 31st State Board Meeting
Chapter financial reports to state due

Membership Postings

In accordance with SEAW bylaws, membership applications are vetted by the Executive Director, granted probationary status by the chapter board, and posted for membership comment. Membership is considered accepted 30 days after posting if current year dues are paid and no member objections have been received.

Glen Griswold
SNC-Lavalin
BSCE 1979 University of Washington
Licensed SE, WA
Class: Member SE

Jane Johnson
Seattle Public Utilities (intern)
AS 2012, Shoreline CC
Current: Seattle University
Class: Student

Frank Labrador
SNC Lavalin
BSCE 1979, Seattle University
Class: Associate

Siqi Lu
Bachelor degree, 2013, University of Nottingham
Current: Master’s program, University of Washington

Michael McCann
MMC Engineering
BSCE 1970, MBA 1978
University of Washington
Licensed SE, WA
Class: Member SE

Christine Vaggione
TY Lin International
BSCE 2007, University of Nevada, Reno
MSCE 2009, University of California, Berkeley
Class: Associate

Noa Yates
Civil BA, 2013, University of Portland
Current: Master’s Civil, University of Washington
Class: Student

Joost Zeegers
ZEI
BSCE 1991 Portland State University
Licensed PE, WA
Class: Member PE

Wishing you a Peaceful, Prosperous, and Happy New Year!