



CONNECTIONS In Brief

December 2016 Volume 17 Issue 2

Newsletter of the
Structural Engineers
Association of Oregon

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Upcoming SEAO Meetings and Events:

Wednesday, January 25, 2017: SEAO Lunch Meeting

Topic: TBD

Location: Portland City Grill, 111 SW 5th Ave. 30th Floor, Portland, OR

Time: 11:30am Check-In and Lunch, 12:00pm Presentation

PDH Credit: 1 hour

Look for more information in upcoming newsletters.

Wednesday, February 22, 2017: Annual SEAO SF Tradeshow

Look for more information in upcoming newsletters.

Thursday, February 23, 2017: 53rd Annual Engineers Week Banquet - Host a High School Student

Topic: Engineering Global Health

Speaker: Evan A. Thomas, P.E., Associate Professor and Director of Sweet Lab at PSU

Time: 6:30 pm to 8:30 pm

Location: Lloyd Center DoubleTree by Hilton Hotel, 1000 NE Multnomah Street, Portland OR

Visit website to become a sponsor <http://www.oregonengineersweek.org/sponsorship/sponsor>, or see flyer on Page 10 for more information.

SEAO has a twitter
account and can be
followed at
[@SEAOregon](https://twitter.com/SEAOregon).



CONNECTIONS is a monthly publication of the Structural Engineers Association of Oregon, published to disseminate current news to our membership and others involved in the profession of structural engineering. The opinions expressed reflect those of the author and, except where noted, do not represent a position of SEAO.

Send membership inquiries to:
9220 SW Barbur Blvd.
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Portland, OR 97219

SEAO COMMITTEE NEEDS

SEAO is in need of several people to head up committees. Each of the following need new Chairpersons now or in the near future.

- Program Committee - plans and schedules membership meeting speakers
- Special Inspections Committee - reviews and comments on issues related to special inspection
- Legislative Committee - follows legislative issues related to structural engineering
- Newsletter Committee - compiles and assembles monthly newsletters

If you have an interest in any of these areas of service, or have a suggestion for a nominee for those positions, please contact Jane Ellsworth or any Board member (see side of page). Most committee chair positions require a minimal amount of time on the average.

We are also always appreciative of any members who are willing to serve on a committee. The Awards Committee, in particular, is currently looking for new members. If interested, please contact Brynn Adkins (brynn@wdyi.com). The Newsletter Committee is also looking for someone that might be interested in writing the monthly meeting summaries.

SEAO and the structural engineering community need your knowledge and skills!

BOARD OF DIRECTORS

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DUES REMINDER

Annual dues for SEAO membership were due on **October 31, 2016**. You can make checks payable to SEAO and mail to: 9220 SW Barbur Blvd, No. 119
Portland, OR 97219

Or renew online using a credit card by going to: www.seao.org

Renewals: Member (licensed PE in Oregon): \$102
Affiliate Member: \$95
Student Member: \$16.50
Retired Members: \$25

Membership must be current (dues paid) to have your name included in our annual roster.

To update our records, please be sure that we have your correct address, name of your company, current phone numbers, and your email address. This will guarantee that you are receiving all correspondence and information from SEAO. You can update your information online, or if you have any questions contact jane@seao.org.

SEAO COMMITTEES

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NCSEA PULLS OFF ANOTHER GREAT SUMMIT

BY: ED QUESENBERRY

In early October this year, NCSEA held its annual Structural Engineering Summit at the Disney Contemporary Resort in Orlando, Florida. Joining me at The Summit this year from SEAO was Jane Ellsworth, who participated in the Executive Director meetings, and Leif Erickson, who won a Young Member Scholarship to attend the Summit at no cost (Congrats Leif!!).

The format of The Summit was relatively the same as previous years, and was as follows:

- Wednesday: NCSEA Committee meetings, NCSEA Board Meetings, Summit Registration Opens, and the Computers and Structures Incorporated (CSI)-sponsored Summit Kick-Off Gala
- Thursday: Delegate Breakfast, Keynote Address, Technical Sessions and Trade Show opens
- Friday: Delegate Collaboration Session, Vendor Presentations, Concurrent Technical Sessions and Trade Show, followed by the NCSEA Excellence in Structural Engineering Awards Gala
- Saturday: NCSEA Annual Business Meeting

As you can see, The Summit does not lack for events or interesting things to do! As part of my responsibilities as a member of the NCSEA Communications Committee, I helped to organize and facilitate the Delegate events at The Summit. Pair that commitment with my responsibilities as SEAO's Delegate to NCSEA, and most of my time at The Summit was spent on Delegate-related activities.

NCSEA's stated mission is to "...advance the practice of structural engineering by representing and strengthening its Member Organizations". The main conduits linking NCSEA to its' 44 member organizations (MOs) for the purposes of following this mission are the Delegates. One of the goals of The Summit is to provide opportunities for Delegates from across the nation to interact, share ideas from each of their respective state organizations, and discuss issues facing our profession.

The "main event" for the Delegates at The Summit is the Delegate Collaboration Session, which takes place on Friday morning. This is a two hour session at which issues facing NCSEA's member organizations are discussed in a roundtable format, facilitated by NCSEA Board Members. This year the following four topics were discussed:

- Collaborating with Other Professional Organizations (ASCE, AIA, etc.)
- Establishing Structural Licensure in your State
- Geographical Challenges to Member Engagement
- Enhancing Legislative and Public Outreach Efforts within MO

The 60+ Delegates that participated in this session were able to rotate through the roundtable discussions on 3 of the 4 topics throughout the 2 hour session, sharing ideas or challenges from their state organizations related to the topics they selected. The Delegates' input was recorded and disseminated into a quick reference guide called *The MO Toolbox*. The goal of *The MO Toolbox* is to provide the Board of each state MO a succinct list of ideas that have been found to be successful toward overcoming challenges that are common to most state SEAs. A copy of this resource has been given to the SEAO Board for their use in the coming year. If you are interested in seeing *The MO Toolbox* and a summary of what was discussed in Orlando, you can find it at <http://www.ncsea.com/members/organizations/>.

(Continued on page 4.)

NCSEA PULLS OFF ANOTHER GREAT SUMMIT (CONT.)

(Continued from page 3.)

There was much more to The Summit than just the Delegate events. The Technical Sessions were very strong this year, with topics covering the latest in wind and seismic design, new developments in the steel, wood, masonry and concrete codes, as well as some insightful business-related topics. The social events were top-notch as well, with the CSI Gala hosted by Ashraf Habibulah, complete with a live band, I-Pad giveaway and amazing food raising the bar for Summit parties to a whole new level. The Excellence in Structural Engineering Awards Gala was full of pomp and circumstance as amazing works of engineering from around the world were celebrated.

Each year I attend the NCSEA Annual Summit, I am reminded of just how much NCSEA does for our profession. The behind-the-scenes committee work, advocacy and MO support efforts, and continuing education opportunities NCSEA executes combine to continually improve the lives of practicing structural engineers. What is even more impressive to see is that most of this improvement is the result of the work of volunteers; practicing engineers who recognize the importance of giving back to the profession so that it can endure for generations to come.

I encourage all of you reading this article to consider attending the 2017 NCSEA Structural Engineering Summit, October 11-14 in Washington D.C. Please check the NCSEA website www.ncsea.com in the coming months for updates on the program and events, and sign up early!

Lastly, I would like to thank SEAO for recognizing the importance of having representation at The Summit and for sponsoring my attendance. As the Delegate role transitions to Seth Thomas and Amit Kumar this year, I can honestly say that serving as Delegate these past 4 years has been very fulfilling personally and professionally, and I have the SEAO membership to thank for allowing me this opportunity.

SEISMIC EVENTS

[ASCE Webinars](#)

Tuesday, January 24, 2017, 8:30 AM – 10:00 AM PST.
[Seismic Bracing for Mechanical and Electrical Building Components.](#)

Wednesday, January 25, 2017, 8:30 AM – 10:00 AM PST. [The Seismic Coefficient Method for Slope and Retaining Wall Design.](#)

ASK A QUESTION, GET AN ANSWER

Do you have a code question you would like to ask the Wind Committee or Snow Committee? SEAO is pleased to announce a simple way for Q&A's with technical committees. Email questions to jane@seao.org, and SEAO will direct your question to the appropriate committee chair for a response. Questions and their answers will be made anonymous and available to the membership on the website www.seao.org.

Committees include: Seismic, Wind, Snow, Code, Vintage Building, and Special Inspections.

VENDOR ADVERTISING

SEAO is now accepting vendor advertising!

Cost of a full page ad running for one month:

\$250 - Members

\$350 - Non Members

For more information, contact Jane Ellsworth at jane@seao.org.

OCTOBER MEETING RECAP

BY: DEANNA KUHLMAN



Topic: Seismic Renovation of an Historic Building Using Fluid Viscous Dampers

Speaker:
Mark Tobin, PE, SE
KPFF Consulting Engineers

This presentation focused on the retrofit of the historic Galleria Building in downtown Portland. The complex retrofit of the core and shell was designed by KPFF Consulting Engineers and FFA Architects. Because the building is in downtown Portland, it was subject to historic review, and the renovation was triggered by the anchor tenant (Target) and a change in occupancy.



The Galleria was built around 1910, and has gone through several remodels. It is a steel framed building with pan joists and semi-rigid moment frames. It was originally designed to be 11 stories, but only 5

stories were built. The lateral system was a buffet of sorts- a lot of elements, but not very effective. Viscous seismic dampers were chosen to retrofit this building and were distributed on the 1st through 4th floors. In addition, diaphragms were strengthened locally and grade beams were added.

Why seismic dampers?

- Compatible with flexible lateral system
- Allowed for a flexible layout
- Limit interstory drift (which would preserve the terracotta exterior)
- Dissipate energy via heat- the prototype test generated a temperature of 189 degrees with 20 cycles at 20% velocity

A viscous damper prototype from Taylor Devices was built to test and calibrate behavior prior to mass production. Around 64 seismic dampers were used on this project with capacities ranging from 175k-425k (based on location in building) with around a 1.5in stroke. To install the dampers, many existing beams and diaphragms needed to be strengthened. The dampers were installed in steel chevron braces. The configuration of the brace (up or downward) was driven by architectural requirements.

Design:

- Used ASCE 41-06
- Occupancy category III
- Knowledge factor of 1.0- performed testing
- GeoDesign found the ground motions for specific site area



Modeling:

- Used 48 time history cases
- The steel frames were preloaded before the time history to capture behavior
- Justifying the existing columns required significant analysis. The maximum axial loads occurred at different times than the maximum bending stresses. If the maximums were applied simultaneously, the columns failed. To justify the columns, each time step was analyzed individually, which equated to 542,000 data points per column per floor.
- Grade beams and dampers were overly complicated to model as non-linear elements, so they were modeled as linear then checked to see if they remained elastic.
- Dampers were modeled as braces with a nonlinear link
- The expected drift was 1% or less
- Grade beams were added due to uplift issues from the damper frames

Lessons learned:

- This retrofit was cost effective
- Significant increase in design effort (and fee) requiring 3-4 months
- Peer review required for structural and geotechnical design
- Larger dampers are not always better- not an intuitive process
- Utilized spectral velocity between floors instead of tracing forces
- The dampers had a long lead time, but installation can be done after the frame is constructed

PE REVIEW COURSE

Portland State University Department of Civil and Environmental Engineering offers a review course that is designed to help you prepare for the Professional Engineering (PE) exam. The course reviews each of the exam subject areas weekly and is taught by PSU and OSU faculty and licensed professionals. This non-credit course is offered once per year. This year the course runs Tuesdays 6:00pm to 8:50pm, January 10 to March 14, 2016 on the PSU campus. See <http://www.pdx.edu/cee/pe-review-course> for more information and to register for the course.

JUDGES NEEDED!!

Judges Needed for AISC/ASCE National Steel Bridge Contest at OSU

Oregon State University has the honor of hosting the 2017 National Student Steel Bridge Competition (NSSBC). Help us to make the 2017 NSSBC "a resounding success!" No prior experience necessary! Complete the information in the form at the link below to sign up to be a judge.

<http://goo.gl/forms/trXa37mWridEr0Bc2>

Priority will be given to the earliest responses. Partial travel support is expected to be available for judges who reside outside of Oregon.

For more information about the NSSBC, including the video announcing Oregon State as the host school for the 2017 NSSBC, go to <http://www.aisc.org/steelbridge>.

Feel free to contact us with any questions!
(thomas.miller@oregonstate.edu or
judy.liu@oregonstate.edu)

SEAO RECRUITMENT FLYER

On page 9 of this newsletter is a printable flyer that we ask you to post in your office to remind engineers of the benefits to them and need by SEAO of their involvement in the organization. Please take a moment to print and post it. Thank you!

STRUCTURAL MASONRY DESIGN SEMINAR

The Northwest Concrete Masonry Association will be conducting a full-day seminar focusing on the design of reinforced concrete masonry construction. Both working stress and strength design methods of the new 2015 IBC and 2013 TMS 402/ACI 530 masonry codes will be covered.

The seminar will include the explanation of new code provisions and step-by-step 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. It will be presented by two professional engineers at each location. The seminar will consist of 7.5 hours of continuing education. Certificates of attendance will be issued.

Seminar dates and locations include:

February 8, 2017 - Oregon City, OR

Additional information can be obtained from the Northwest Concrete Masonry Association at 425.697.5298 or www.nwcma.org.

NEW MEMBERS

The newest member to join SEAO is:

Geoff Gore - TM Rippey

Welcome New Member!!

Excerpt from the *Significant Changes to the International Building Code, 2015 edition*

1804.1

Excavation Near Foundations

CHANGE TYPE: Addition

CHANGE SUMMARY: Basic requirements for providing safe and adequate underpinning at excavations have been added because the code was not specific on how to address excavations adjacent to structures.

2015 CODE: 1804.1 Excavation Near Foundations. Excavation for any purpose shall not ~~remove~~reduce lateral support from any foundation or adjacent foundation without first underpinning or protecting the foundation against ~~settlement or lateral translation~~ detrimental lateral or vertical movement, or both.

1804.2 Underpinning. Where underpinning is chosen to provide the protection or support of adjacent structures, the underpinning system shall be designed and installed in accordance with provisions of this chapter and Chapter 33.

1804.2.1 Underpinning Sequencing. Underpinning shall be installed in a sequential manner that protects the neighboring structure and the working construction site. The sequence of installation shall be identified in the approved construction documents.

CHANGE SIGNIFICANCE: Specific requirements related to the excavation of foundations adjacent to structures had not previously been addressed in the IBC. Although Section 3307, Protection of Adjacent Property, requires adjoining public and private property, including footings, foundations, party walls and so forth, to be adequately protected from damage during construction, remodeling and demolition work, there were no specific details provided. Because the IBC contained very little detail, due diligence was required during excavations near neighboring structures to meet the intent of the code. Failures to perform proper pre-construction investigations and monitoring procedures have led to failures in construction during underpinning and excavation operations. Improperly constructed excavations have resulted in doors and windows that don't open, cracking of bearing walls and support members, failures of some critical structural members and even collapses resulting in fatalities.

Because the term "detrimental" is used to discuss settlement in other provisions of Chapter 18, as well as other chapters of the IBC, the term has been added here as well. The term "remove support" was changed to "reduce support," because the removal of support could lead to a failure. As indicated in Section 1803.5.7, underpinning is only one way of providing support; thus new Section 1804.2 provides requirements when underpinning is chosen to provide support.



Foundation excavation

EMPLOYMENT OPPORTUNITIES

CATENA CONSULTING ENGINEERS

Structural Engineer
Portland, OR

catena consulting engineers provides the personal environment of a small firm while providing the opportunity to work on a variety of projects. Our projects vary in size from a single day's effort to large projects with construction values in excess of \$300 million. You will gain design experience in concrete, steel, timber, and masonry buildings and will work on a wide variety of project types including buildings created for healing, learning, living, and interacting. Due to the technical complexity and challenge of many of our projects, we seek engineers that hold a Master's degree, and that have a desire to learn, grow, and be challenged. U.S. citizenship is preferred. We are currently seeking engineers with 0-6 years of experience in structural engineering for buildings. For a detailed advertisement and to submit your resume, visit our website <http://www.catenaengineers.com/opportunities.php>.

KPFF PORTLAND

Structural Engineer
Portland, OR

KPFF Portland is looking for Experienced Structural Engineers who are motivated and interested in an opportunity for growth. KPFF is about freedom. Freedom to work on what inspires you. Our engineers work on a vast spectrum of projects that are located around the globe: from anchorage of mechanical systems to complex, non-linear analysis of high-rise structures. We have the benefits of a large, stable firm but none of the red tape that comes with it. Providing first-class service to our clients is what we're about. We are a group of dedicated, friendly, collaborative, hard-working professionals. We are looking for exceptional modelers to join us. Please use the appropriate link below for full details. KPFF is an equal opportunity employer.

Experienced Structural Engineer:

Apply Here:

http://chc.tbe.taleo.net/chc05/ats/careers/requisition.jsp?org=KPFF_2&cws=63&rid=73

WRK ENGINEERS

Multiple Engineering Positions
Vancouver, WA

WRK Engineers is looking for positive, team oriented engineers to join our firm. We offer a creative, challenging, and energetic environment, and work on a wide variety of structural projects. Our projects include design of commercial, infrastructure, and industrial facilities as well as seismic evaluation, resiliency, and strengthening of existing facilities locally and internationally. Ideal team members will have zero to ten years of experience and be competent designing with all major construction materials. Suitable designers will have an undergraduate in Civil or Structural engineering with a preference for a Structural graduate degree and licensed PE.

We offer competitive salaries, benefits, and flexible work hours.

Visit <http://www.wrkengrs.com/careers/> to view position descriptions and submit your resume.



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ARE YOU IN THE GAME...

OR ARE YOU A BENCHWARMER?

The Structural Engineers Association of Oregon is there for you, but it also needs you.

If you aren't a member, visit seao.org for the benefits of membership.

If you are a member and you are not yet involved, there are many ways you can help the public and the engineering community...
...and learn and grow at the same time.

Email jane@seao.org or look online for the email address of a current board member to ask for information or to volunteer to serve.



*Celebrating over 50
years of growing
new engineers in
Oregon &
Washington*

53rd Annual E-Week High School Program

You are an essential part of the 53rd Annual Engineers Week High School Program.

Date: Thursday, February 23, 2017

Location: Lloyd Center DoubleTree by Hilton Hotel - 1000 NE Multnomah St.

To participate at E-week, do one of the following:

- 1) Go to <http://www.oregonengineersweek.org/sponsorship/> for online registration.
- 2) Send in the following form and a sponsor check (see details on next page).

We will contact you with additional day of the event information.

Engineers Week Sponsorship Levels

		Sponsor Included on E-week Web and Facebook Pages	Title Sponsor on all Event Publications*	Official Sponsor of College Seminars	Number of Sponsored Students	# Banquet Dinner Tickets for Your Organization
<i>Platinum</i>	\$2,000	✓	✓	✓	20	15
<i>Gold</i>	\$1,000	✓	✓	.	10	10
<i>Silver</i>	\$500	✓	.	.	5	5
<i>Individual</i>	\$75	.	.	.	1	1

*Title sponsors will be included on all event publications if program support is committed by December 31, 2016.

E-week Sponsor Registration

Organization Name: _____

Is this a public agency or non-profit? If so, do you want to participate in the Exhibit Hall?

Yes please – contact me with more information

Contact Name: _____

Email Address: _____

Phone Number: _____

Sponsor level - check one:

Platinum \$2,000

Gold \$1,000

Silver \$500

Individual \$75 x ___ # of attendees

I cannot attend, but I would like to sponsor a student - \$40

Send this form and a sponsor check payable to "ASCE Oregon Engineers Week" to:

Tova Peltz
c/o Oregon Department of Transportation
123 NW Flanders Street
Portland OR 97209.

We will confirm receipt of your registration and send more day of event details.

Please email tova.r.peltz@odot.state.or.us with any questions.

The Engineers Week High School Program is a tax-deductible program affiliated with the American Society of Civil Engineers, a 501c3 non-profit organization.