Upcoming SEAO Meetings and Events:

Thursday August 25, 2016: YMF Summer Picnic
Location: Westmoreland Park, Portland
Time: 5:00pm
See Page 5 for additional information.

Wednesday September 14 to Saturday September 17, 2016: NCSEA Conference
Keynote Speaker: Kent Estes, Ph.D, S.E., Walt Disney Imagineering
Location: Orlando, Florida
See website for additional information.

Friday September 16: 2016 OSBEELS Symposium
Keynote Speaker: Betsy Spomer, CEO of Jordan Cove LNG
Location: Salem Convention Center
See Page 7 for additional information.

Wednesday, September 28, 2016: SEAO Excellence in Structural Engineering Awards Presentation and Dinner Meeting
Topic: Cities of the Future
Speaker: Paddy Tillett, ZGF Architects, LLP
Location: The Sentinel, 614 SW 11th Ave., Portland, OR, The Billiard Room
Time: 5:30pm Check-In and Social, 6:15pm Dinner, 6:30 pm Program
PDH Credit: 1 hour
See Page 2 for additional information.

SEAO has a twitter account and can be followed at @SEAOregon.
Please join SEAO for the 2nd Annual Excellence in Structural Engineering Awards presentation. The meeting will feature keynote speaker Paddy Tillett, of ZGF Architects, LLP presenting, “Cities of the Future”.

Awards will be presented to the winning projects, as selected by an esteemed panel of independent judges, in the following categories:

- Jurors’ Favorite
- New Buildings Over $10M
- New Buildings Under $10M
- Renovation/Retrofit
- Special Use Structures

In addition to the Awards and Speaker, we will be installing the new SEAO Board, announcing the SEAOSF Scholarship winners, and presenting the Life Member Award.

This is a meeting you don’t want to miss!

**Topic: Cities of the Future**

Talk of cities of the future usually brings to mind images from science fiction: streamlined towers and misty skylines. The reality will be less glamorous, but we need to decide how to shape our cities. If we do nothing, the mistakes of today will be magnified. This presentation will draw on what we already know to suggest some radical initiatives that will make tomorrow’s cities more livable than many that we know today.

**Speaker: Paddy Tillett, ZGF Architects, LLP**

Paddy Tillett grew up in rural Scotland, completing his formal education in Oxford and Liverpool. He practiced architecture and planning in London and many other parts of the world before settling in Portland, Oregon in 1982. He is a principal with ZGF Architects LLP focusing on planning and urban design, and an adjunct professor at Portland State University. Paddy is a Fellow of the Royal Town Planning Institute, a member of the Royal Institute of British Architects, a Fellow of the American Institute of Certified Planners, a Fellow of the American Institute of Architects, and an Accredited LEED Professional.

**Details:**

- **Location:** The Sentinel, 614 SW 11th Ave., Portland, OR, The Billiard Room
- **Time:** 5:30 pm — Check in and Social  
  6:15 pm — Dinner  
  6:30 pm — Program
- **Cost:**  
  $32 — Prepaid Members  
  $20 — Prepaid YMF Members  
  $42 — Prepaid Non-Members  
  Free — Students

**Reservations:** Pre-registration is required for all. You can register and pay online at [www.seao.org](http://www.seao.org) before noon, Friday, September 23. You can also register with Jane Ellsworth via phone at (503)753-3075 or via Email: jane@seao.org. Note: No-shows will be billed.

**PDH Credit:** One PDH has been recommended for this program.
Joint SEI/SEAO Meeting

As a joint SEI/SEAO meeting, the evening was based on a TED talk format. Dr. Chris Goldfinger, Amit Kumar, Carmen Merlo, and Steve Drahota were selected for their expertise related to seismic design and rehabilitation in Oregon.

The Really Big One: Evidence for Great Earthquakes in Cascadia and Inland Ground Motions

Dr. Chris Goldfinger is the director of the Active Tectonics and Seafloor Mapping Laboratory at the College of Earth, Ocean, and Atmospheric Sciences in Oregon State University.

Prior to the 1960s, little was known about earthquakes. However, once plate tectonics and seafloor spreading was validated, a larger interest in earthquake research was initiated. The knowledge of subduction zones became more commonplace, and geological data was compiled.

Since then, our own Cascadia fault has received increasing recognition (especially over the recent years) and is becoming a familiar name in plate tectonics. The Cascadia fault has a locked plate boundary, a characteristic rare in most faults. In addition, the fault has produced few earthquakes greater than magnitude 6. There have been two significant earthquakes in the past 10,000 years on the fault, and the last big earthquake was 60,000 years ago.

For years, theories tried to provide a reason for our seemingly dormant fault. Some theories conjectured that the plate recently stopped moving and would need time to build up stress to rupture the fault. Alternatively, it was proposed that sediment from the Columbia River was lubricating the fault and preventing earthquakes. Neither proved to be true, and it has been agreed upon that the boundary is locked. However, it is estimated that Portland moves approximately 2-3mm per year. Measured by GPS, the coastline moves around 10mm per year.

In an effort to correlate turbidities (sediment deposited by a turbidity current) to past earthquakes, Dr. Goldfinger’s research took core samples along the Cascadia subduction zone. The theory that turbidities were related to earthquakes was developed by John Adams in 1990. Adams proposed that the Mazama ash deposit (ash expelled from Mt. Mazama — currently Crater Lake) embedded in soil can be used as a marker for a past earthquake. To prove this, the ash expelled from the volcano was found in 13 separate canyon systems at the same time.

To identify the Mazama ash as their marker, researchers used CT scans to analyze the cores taken from the sea floor. The density of the core was related to magnetism and could be related to the time of the seismic event. Dr. Goldfinger’s research has identified 16 post Mazama earthquakes in the Cascadia subduction zone.

In an effort to correlate turbidities (sediment deposited by a turbidity current) to past earthquakes, Dr. Goldfinger’s research took core samples along the Cascadia subduction zone. The theory that turbidities were related to earthquakes was developed by John Adams in 1990. Adams proposed that the Mazama ash deposit (ash expelled from Mt. Mazama — currently Crater Lake) embedded in soil can be used as a marker for a past earthquake. To prove this, the ash expelled from the volcano was found in 13 separate canyon systems at the same time.

To identify the Mazama ash as their marker, researchers used CT scans to analyze the cores taken from the sea floor. The density of the core was related to magnetism and could be related to the time of the seismic event. Dr. Goldfinger’s research has identified 16 post Mazama earthquakes in the Cascadia subduction zone.

In an effort to correlate turbidities (sediment deposited by a turbidity current) to past earthquakes, Dr. Goldfinger’s research took core samples along the Cascadia subduction zone. The theory that turbidities were related to earthquakes was developed by John Adams in 1990. Adams proposed that the Mazama ash deposit (ash expelled from Mt. Mazama — currently Crater Lake) embedded in soil can be used as a marker for a past earthquake. To prove this, the ash expelled from the volcano was found in 13 separate canyon systems at the same time.
MAY MEETING RECAP (CONT.)

State of the Unreinforced Masonry Buildings and Ordinance in the City of Portland

Amit Kumar is the senior engineer for the City of Portland Building Services, and Carmen Merlo is the director of the Portland Bureau of Emergency Management.

Unreinforced masonry (URM) buildings present long term risk and damage potential to our infrastructure. URM buildings pose a significantly higher risk to pedestrians and traffic outside the buildings during a seismic event than other building types. URM building performance was well documented in the Christchurch earthquake. Around 42 out of the 185 deaths from the event were related to URM buildings. Additionally, most of these deaths occurred outside of the building.

In light of recent URM building failures, the city council directed select staff members to assess the risk of URM buildings in Portland. In May of 2014, several committees were formed including a retrofit committee, a support committee, and a policy committee.

The retrofit committee created a database of URM buildings in Portland for public use. The database has recorded:
- 1884 URM buildings in Portland
- 153 have been demolished
- 87 have been fully upgraded
- 160 have been partially upgraded

Currently, the existing Portland Title 24.85 triggers an upgrade only if there is a renovation or change of occupancy. This Title has been in effect for the past 20 years but will not prevent the risk expected in the next seismic event. Therefore, the goal of the URM committees is to regulate these upgrades and minimize risk through new upgrade requirements/triggers.

The committee is looking at California laws as an example. California is currently at 80% compliance with their seismic goals, where Portland is around 15% compliance. But the question is, what standards should Portland be held to? The URM committee came up with a ranking system with the city's infrastructure and the importance of the building.

The URM committee has had several public meetings with stakeholders to discuss their plan. The committee is expected to make recommendations to the city council by the end of the year. If the city council approves, the mandatory retrofit timeline will be made into law. To implement this change in policy, grants and loans will be utilized for building owners. Property tax exemptions and tax credits may also be available. The city is open to many retrofitting techniques including shotcrete and FRP strengthening of the URM walls, but there is no prescribed method for a given structure. See below for a link to the map of URM buildings in Portland.

http://pdx.maps.arcgis.com/apps/Viewer/index.html?appid=a920f2a1fd2746f1a7efad1262aa1312

The Art of Seismic Retrofits

Steve Drahota: Vice President, Transportation Business Development Manager, Oregon, HDR.

The goal of this presentation was to summarize some of Steve’s best practices and techniques for navigating a seismic retrofit of a bridge.

As a general rule:
- Prior to 1970 there was little to no seismic design in bridges
- 1970-1990 some seismic design was incorporated in bridge design
- 1990-present there are much stronger seismic requirements in effect

The Oregon department of Transportation has a tier criteria for seismic events. For the 1,000 year event, life safety is the priority. In some cases spalling (knee joints, etc.) is acceptable and in some more extreme cases total lateral movement may be acceptable. It is important to know what level you are designing for.

Analysis techniques:
- Simplify your model- use simple pushover analysis (except in multi column bents). Try to bound your solutions.
- Identify key analysis assumptions- look at ARS curve reliability, keep in mind unobservable as built conditions, material strengths and uncertainty, nonlinear stiffness of foundation, and identify any geometric non linearity, look for seismic joints.
- Start simple- get the period, find the acceleration, solve for displacement.
- Always know your answer. Know what to expect before modeling- have a plan for your model.
- Accept that engineers don’t know everything- and that it’s not our fault if we don’t know everything.
- Identify any “franken-bridges” or a bridge that has been added on to over time that would create model irregularities.
- Visualize strategies first- what is the best decision for modeling, identify your weakest link in the system.
- Each bridge component may need a different strategy. The deck may have a different approach than the substructure or foundation.
- Keep in mind: more reinforcement does not always translate to better performance- cutting reinforcing may provide better ductility.
SEAO/OACI GOLF TOURNAMENT RECAP

The annual golf tournament has come and gone and was a great success. A hot and wonderful time was had by all.

Congratulations to the winners from VLMK! Pictured below from left: Colby Anderson, Tony Jenkins, Stephen Stenberg, and Ken Rust.

And let’s not forget the lucky raffle winners:
- Nike Wedge – Brandon Sirois, Whitaker Ellis
- 2 sets of Mariner Tickets – Sean Owens, ABC Fibers
- Wheel Barrow – Justin Cook, Catena Engineers
- Power Washer – Stuart Pomeroy, ICON
- Apple Watch – Anthony Boudon, Miller Consulting Engineers
- Tuna Fishing Trip – Chris Krabill – Dayton Superior
- Salmon Fishing Trip – John VanKeulen, Quality Concrete
- 48” TV – Kenny Dupuis – Smith Monroe & Gray
- Coolest Cooler – Mike Archer, Archer Engineering
- Yeti Cooler – Chris Krabill, Dayton Superior
- Cleveland Wedge – Lane Jobe, Miller Consulting Engineers

Big thanks to all the sponsors and everyone who attended!!

WEBINAR SERIES: THE CASE FOR RESILIENT DESIGN

The United States Resiliency Council and Clark Pacific have teamed up to bring a four part complimentary Webinar Series: The Case for Resilient Design.

Here are the topics and dates for each session.

- **Session 1a:** Resilient Based Design & Risk Assessment, September 14 at 11:00 a.m. PDT. Featuring Curt Haselton and Ronald Hamburger. In this session we will cover:
  - The value of FEMA P-58
  - What’s new in FEMA P-58
  - How to easily implement FEMA P-58
  - SP3 Software: Technology designed to obtain a risk assessment in hours not days
- **Session 1b:** **In-Depth Learning Session**: A Deep Dive into FEMA P-58 and SP3. This session will go into more in-depth technical discussion for those that want the nitty-gritty details of the two subjects. September 22 10am -12 noon, PDT Featuring Curt Haselton and Ronald Hamburger.
- **Session 2:** Quantifying and Communicating Resilient Design: A Standardized Rating System, October 6 at 11:00 a.m. PDT Featuring Curt Haselton and Evan Reis
- **Session 3:** Resilient Design in the Real World: Case Study Webinar, October 26 at 11:00 a.m.
- **Session 4:** The Financial Return on Resilient Design, November 16 at 11:00 a.m.

See website for more information and to register.

YOUNG MEMBER FORUM ACTIVITIES

By: Phillip Davis

Upcoming YMF Events:

Thursday August 25th – Summer Picnic
Location: Westmoreland Park, Portland
Time: 5:00pm
We will barbeque burgers and hot dogs and have various beverages. Please RSVP to Phil by August 15th: pdavis@seftconsulting.com.

YMF Website Info:
http://www.seao.org/committees/advocacy/ymf/
Please visit our website for more information on YMF events and information.
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.

HOLMES CULLEY
Structural Engineer
San Francisco and Los Angeles, CA

Holmes Culley is a California based structural engineering firm dedicated to providing quality service and creative design solutions. As part of the New Zealand based Holmes Group, we are an international practice with over 300 professionals in six offices, providing engineering expertise to clients along the West Coast and throughout the Pacific Region. We are seeking structural engineers with 5+ years design experience for both our San Francisco and Los Angeles offices; M.S. degree in Structural Engineering and PE license are preferred.

Check us out at www.holmesculley.com and send your resume with cover letter to hr@holmesculley.com.

SEISMIC EVENTS

ASCE Webinars

Friday, September 16, 2016, 8:30 AM – 10:00 AM PST.
Design of Lateral Load Resisting Systems in Masonry Buildings.

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.
### Presentations Offered

<table>
<thead>
<tr>
<th>Presentation</th>
<th>Speaker</th>
</tr>
</thead>
<tbody>
<tr>
<td>Portland Water Bureau Resiliency Planning</td>
<td>Tim Collins, PE, Portland Water Bureau</td>
</tr>
<tr>
<td>Ground Source Heat Pump System Design for Cavalier Air Force Station</td>
<td>Paul D. Stull III, PE, Amec Foster Wheeler</td>
</tr>
<tr>
<td>Klamath Basin Litigation and Negotiation</td>
<td>Jesse Ratcliffe, Sr. AAG, Oregon Department of Justice</td>
</tr>
<tr>
<td>To be announced</td>
<td>Christine Shirley, Oregon Department of Land Conservation and Development</td>
</tr>
<tr>
<td>River Surveying and Design Basics</td>
<td>Russ Lawrence, PE/PLS/CWRE, StreamFix</td>
</tr>
<tr>
<td>To be announced</td>
<td>Russ Faux, Quantum Spatial</td>
</tr>
<tr>
<td>Basics of Water Boundaries</td>
<td>May Hartel, Bureau of Land Management Oregon State Office</td>
</tr>
<tr>
<td>An Introduction to Water Rights in Oregon</td>
<td>Gerry Clark, Oregon Water Resources Department</td>
</tr>
</tbody>
</table>

**A Lunch/Keynote presentation will be given by Betsy Spomer, CEO of Jordan Cove LNG from 11:30 am - 1 pm.**

**$80 Registration Fee**

Registration includes lunch, materials, and refreshments during breaks.

Attendance for the full day will earn registrants 8 PDHs. Each hour of class time is worth 1 PDH.

**Friday September 16, 2016**

@The Salem Convention Center  
200 Commercial Street SE, Salem OR 97301  
7:30 a.m. Check-in begins | 11:30 a.m. Lunch and keynote presentation  
Visit [www.oregon.gov/OSBEELS](http://www.oregon.gov/OSBEELS) for more information
**Registration Information**

Name: PE PLS RPP CWRE

Preferred Name on Badge: 

Dietary Needs: 

**Contact Information**

Mailing Address: 

City: 

State: 

Zip: 

Phone: 

Email: 

**Emergency Contact Information**

Name: 

Phone: 

Presentation Selection (Please choose one presentation from each time slot.)

<table>
<thead>
<tr>
<th>TIME</th>
<th>PRESENTATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30 am - 9:50 am</td>
<td>- Portland Water Bureau Resiliency Planning</td>
</tr>
<tr>
<td></td>
<td>- River Surveying and Design Basics</td>
</tr>
<tr>
<td>10 am - 11:20 am</td>
<td>- Ground Source Heat Pump System Design for Cavalier Air Force Station</td>
</tr>
<tr>
<td></td>
<td>- TBA</td>
</tr>
<tr>
<td>1:10 pm - 2:30 pm</td>
<td>- Klamath Basin Litigation and Negotiation</td>
</tr>
<tr>
<td></td>
<td>- Basics of Water Boundaries</td>
</tr>
<tr>
<td>2:40 pm - 4 pm</td>
<td>- TBA</td>
</tr>
<tr>
<td></td>
<td>- An Introduction to Water Rights in Oregon</td>
</tr>
</tbody>
</table>

**Select payment method (choose one)**

- Check or Money Order (payable to OSBEELS)
- Cash

Amount enclosed: 

- Debit or Credit Card (Visa, Mastercard, Discover, or AmEx)

Total charge to card: 

Card number ____________________________ Exp. date __________ Security code* __________________ Billing Zip/Postal code __________

**Payment Signature (serves as payment authorization if paying by debit or credit card)**

Signature ____________________________ Date (Mo/Day/Yr) __________

*Debit or Credit Card Security Codes

**Refunds and Cancellations** - Only written refund requests will be considered. Requests must include name of attendee and method of payment. Requests may be submitted via standard mail, email, or fax to OSBEELS. Refund requests received less than 10 days prior to the symposium will not be granted. However, registration fees may be transferred to another attendee at no additional charge.


RESERVATIONS METHOD: Rooms are subject to availability of rooms at the time the reservation is made. Please contact the hotel for more information. Call the toll free number to get the group rate, 877-540-7800. Let them know you’re a part of the OSBEELS Symposium in order to receive the special rate. Reservations are based upon availability at the time of the reservation.

ACCESSIBILITY: The facilities are accessible to person with disabilities. Please request ahead of time if auxiliary aids and/or services are needed.