



CONNECTIONS In Brief

August 2016 Volume 16 Issue 8

Newsletter of the
Structural Engineers
Association of Oregon

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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 Sentinal, 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](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.

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SEPTEMBER AWARDS DINNER MEETING ANNOUNCEMENT WEDNESDAY, SEPTEMBER 28, 2016

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 Sentinal, 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 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.

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MAY MEETING RECAP

BY: DEANNA KUHLMAN

talk² 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.



<https://pubs.usgs.gov/fs/2002/fs092-02/>

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 addition, cores were taken 150-200km inland from the subduction zone. Inland cores were taken from sediment in lake beds to enable correlation of USGS ground motions. Testing has also been performed at Portland's own Bull Run reservoir. Dr. Goldfinger's research actually found that the shear vane tests on the cores matched the USGS values exactly. While matching values may have been a coincidence, it does give confidence to the methodology presented and the time series of earthquakes presented in the cores.

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 respect to the city's infrastructure and the importance of the building. The rank will indicate the priority and therefore timeline of mandatory retrofits. The following is an estimate of the proposed timeline. The full report can be found on the City of Portland's website, but the timelines have not been finalized.

- In 3 years all URM buildings will have an ASCE 41 evaluation.
- In 10 years URM category 1 will have a complete upgrade.
- In 20-25 years URM category 2 and 3 will have a complete upgrade.

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 2 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!!

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.

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 a 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.

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

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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

Speaker

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

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.

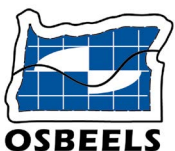
Friday September 16, 2016

@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 for more information



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SEPTEMBER 16, 2016

H₂O OSBEELS SYMPOSIUM

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Standard Mail: OSBEELS

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Salem, OR 97301

Additional forms can also be found on the

OSBEELS Web site at www.oregon.gov/OSBEELS

For questions, call 503-362-2666

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

Hotel Information - The Grand Hotel, 201 Liberty Street SE, Salem, OR 97301 / Toll Free: 877-540-7800 / www.grandhotelsalem.com.

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.