

# FINAL PROGRAM



STRUCTURAL  
ENGINEERING  
INSTITUTE

# STRUCTURES CONGRESS 2019

Orlando, Florida | April 24-27

*The Premier Event in Structural Engineering*



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**HYATT REGENCY ORLANDO**

[www.structurescongress.org](http://www.structurescongress.org) | #Structures19



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## SESSION DETAILS



### Conference App

Download ASCE Conference and Events from the appropriate APP store, install and then open Structures 19. View sessions/speaker details and last minute changes, create a personalized schedule, rate sessions, and contact other attendees. Paper copy of session detail is available upon request at Registration.

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### WiFi

WiFi is provided in the common area at Registration.

## PROFESSIONAL DEVELOPMENT HOURS (PDHS) EARN UP TO 14 PDHS

You may earn PDHs, which are nationally recognized units of record, by attending Structures Congress 2019 technical sessions. Please note there are differences from state to state in continuing education requirements for professional engineering licensure. Each state licensing board has the final authority to approve course, credits, PDHs, and other methods of earning credits in that state. ASCE strongly recommends that individuals regularly check with their state licensing boards for specific continuing education requirements in their jurisdictions that affect professional engineering licensure and the ability to renew licensure.



### SCAN TO RECEIVE PDHS

Make sure to scan your bar code badge before each session (except plenaries and vendor sessions) to ensure you receive PDHs. The scanner will acknowledge a successful recording of your name for the specific session. An email will be sent to registrants within 30 days after the conference with information on how to claim your PDH credits.

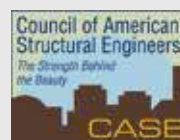
## FLEX REGISTRANTS PDHS

Use the paper form available at Registration. Complete and return to Registration (or by May 14, 2019 to [lmcferran@asce.org](mailto:lmcferran@asce.org)) in order to receive PDH credit.

## PARTNERING ORGANIZATIONS

*The Institution  
of Structural  
Engineers*

## COOPERATING ORGANIZATIONS



A Special Thank You to Structures Congress Premier Sponsor, *Computers & Structures, Inc.*, for funding programming on leadership, innovation, career development, and more, to inspire and develop the next generation of SE Leaders, and advance the SEI Vision for the Future of Structural Engineering.



## WE ARE GLAD YOU'VE JOINED US AT STRUCTURES CONGRESS!

We have a great program planned for you and encourage you to take advantage of every opportunity to introduce yourself to colleagues, ask questions, share your ideas, and learn something new.

### IMAGINE WHAT WE COULD DO FOR THE PROFESSION IF EVERYONE WAS ENGAGED!

#### Get Involved with SEI to advance your career and the profession.

**NEW THIS YEAR** — We have planned a special SEI showcase in the Exhibit Hall and invite you to visit the SEI/ASCE booth (booth #321) to check out membership benefits and opportunities. Learn about SEI efforts and how you can join them to advance your career and the profession.

SEI Leaders will be available at **10:30 a.m. and 3:00 p.m. breaks on Thursday and Friday** to tell you about these initiatives and how to get involved:

- Business & Professional
- Codes & Standards
- Global Activities
- Local and Grad Student Chapters
- Membership
- Technical Activities

#### Career Development

Connect with Anthony Fasano, P.E., M.ASCE, host of the Civil Engineering Podcast and author of the ASCE Careers & Leadership blog.



#### SEI Futures Fund

Meet SEI Futures Fund Board members, donors, and recipients, and learn about current funded projects and opportunities for 2020.

## WEDNESDAY, APRIL 24

**8:00 a.m. – 8:00 p.m.**

### COMMITTEE MEETINGS

**Hyatt Regency Orlando**

(schedule in conference app, at [www.structurescongress.org](http://www.structurescongress.org), and at Registration)

**12:00 – 6:00 p.m.**

### REGISTRATION

**Windermere Foyer**

**1:00 – 5:00 p.m.**

### EXHIBITORS MOVE IN

**Windermere WXYZ**



STRUCTURAL  
ENGINEERING  
INSTITUTE  
Futures Fund

*Investing in the Future of Our Profession*

#### YOUR PARTNER TO:

- Invest in the future of structural engineering
- Support student and young professional involvement in SEI
- Provide opportunities for professional development

#### THANK YOU DONORS!

In 2019 your donations are funding:

- 45 Student & Young Professional Scholarships to Structures Congress
- Codes & Standards Young Professional Funding
- Facilitation Leadership Training
- Sustainability Workshop
- ASCE 7 local lectures
- SE Licensure Research

LEARN MORE AND GIVE AT [WWW.ASCE.ORG/SEIFUTURESFUND](http://WWW.ASCE.ORG/SEIFUTURESFUND)



6:00 a.m.

## RUNNERS

Hyatt Regency Lobby

Participate in a 3–5 mile run – [cherylyn.henry@gmail.com](mailto:cherylyn.henry@gmail.com)

6:30 a.m. – 6:00 p.m. (Closed 1:45 p.m.–2:45 p.m. for lunch)

## REGISTRATION

Windermere Foyer

7:00 a.m. – 7:50 a.m.

## MEET THE LEADERS PROGRAM FOR STUDENTS AND YOUNG PROFESSIONALS

Regency T

### TICKET REQUIRED

(only for students and members 35 and younger)

Sponsored by



7:30 a.m. – 8:00 a.m.

## COFFEE AND TEA

Regency R Foyer

8:15 a.m. – 9:15 a.m.

## OPENING PLENARY PROGRAM AND KEYNOTE SPEAKER

Regency R



### “Regenerative Medicine: Building Tissues and Organs”

The body has an extensive network of cells, tissues and organs. The structural engineering for normal function is complex. Dr. Atala will present an overview of the emerging work to engineer 3-D tissues and organs for implant in patients.

Anthony Atala, M.D., is a practicing surgeon and researcher, W. Boyce Professor and Chair of Urology at Wake Forest University, and Director of the Wake Forest Institute for Regenerative Medicine.

Dr. Atala was elected to the Institute of Medicine of the National Academies of Sciences, to the National Academy of Inventors as a Charter Fellow, and to the American Institute for Medical and Biological Engineering. He has received numerous awards for his work which has been recognized in *Time* Magazine’s top five medical breakthroughs of the year in 2007 and 2011, and in 2013 as one of five discoveries that will change the future of organ transplants.

Keynote Speaker funded by



9:30 a.m. – 10:30 a.m.

## CONCURRENT TECHNICAL SESSIONS

Hyatt Regency Orlando

10:00 a.m. – 6:30 p.m.

## EXHIBIT HALL

Windermere WXYZ

10:30 a.m. – 11:00 a.m.

## REFRESHMENT BREAK IN EXHIBIT HALL

Windermere WXYZ

11:00 a.m. – 12:30 p.m.

## CONCURRENT TECHNICAL SESSIONS

Hyatt Regency Orlando

12:30 – 1:30 p.m. (Ticket required)

## EXHIBIT HALL LUNCH

Windermere WXYZ

1:30 – 3:00 p.m.

## CONCURRENT TECHNICAL SESSIONS

Hyatt Regency Orlando

3:00 – 3:30 p.m.

## REFRESHMENT BREAK IN EXHIBIT HALL

Windermere WXYZ

3:30 – 5:00 p.m.

## SPECIAL SESSIONS

Hyatt Regency Orlando

5:00 – 6:30 p.m. (Ticket Required)

## WELCOME RECEPTION IN EXHIBIT HALL

Windermere WXYZ

6:30 – 8:00 p.m.

## WOMEN IN STRUCTURAL ENGINEERING (WiSE) RECEPTION Celebration 14



Please join us for the Women in Structural Engineering Reception sponsored by the Structural Engineering Institute (SEI) and Computer & Structures, Inc. (CSI). WiSE is a national network of female structural engineers, who work to build a community of women structural engineers throughout the country and the profession. Attendees will have the opportunity to connect with men and women of various backgrounds. All are welcome! For more information about WiSE, visit [www.womeninstructuralengineering.org](http://www.womeninstructuralengineering.org).

Reception sponsored by



and



## VISIT THE EXHIBIT HALL FOR THE LATEST RESOURCES AND OPPORTUNITIES

Check out demos of ASCE 7 Online and the Hazard Tool at the ASCE Bookstore and enter to win a free six-month individual subscription to ASCE 7 Online.



Room	Concurrent Technical Sessions 9:30 a.m. – 10:30 a.m.	Concurrent Technical Sessions 11:00 a.m. – 12:30 p.m.	Concurrent Technical Sessions 1:30 p.m. – 3:00 p.m.
Bay Hill 17–18	ASCE 7-16 Learn from the Experts	ASCE 7-16 Wind: Learn from the Experts	ASCE 7-16 Seismic: Learn from the Experts
Bay Hill 25–26	Preliminary Engineering, Quantities, & Contingencies – Key Ingredients for Design-Build Disputes Between Contractors & Their Designers	Impact of Natural Disasters on the Built Environment	Is Your Tank Half Full or Half Empty?
Bay Hill 19–20	Assessment and Investigation of Deteriorated Concrete Buildings and Bridges	Computational and Hybrid Simulation, Optimization, Condition Assessment	Non-Building Structures Really are Different than Buildings
Bay Hill 21–22	Developing Effective Communication Skills for Engineering Professionals Sponsored by	SE 2050: Understanding Embodied Carbon Measurement and Reduction	Business Bootcamp for Structural Engineers
Bay Hill 23–24	A Review of Modern Grouted Post Tensioned Bridges: Successes, Issues, Evaluation and Solutions	Accelerated Bridge Construction in High Seismic Areas	Life-Cycle Performance of ABC Bridges
Bay Hill 29–30	There is More to Buildings than Just Beams and Columns	A Manual of Practice for Design and Performance of Tall Buildings for Wind	Advances in Performance-Based Engineering for Wind Design of Buildings
Bay Hill 31–32	How Smart Structures are Helping Build Smart Cities	Transitioning from Millennials to Generation Z in the Classroom and Workplace	It's Windy in Florida: Current State-of-the-Art in Wind Engineering Research
Celebration 1–2	Materials for Blast Loading	Advances in Blast Resistant Design Methods and Mitigations	Innovative Use of Materials – Timber, Glass, Steel and Concrete
Celebration 3–4	Tsunami Modeling of Structures – From Buildings to Communities	Beautiful Solutions to the Seismic Beast	A Whole New World of Dampers and Isolation
Celebration 5–6	Innovation in Software and Technology for Structural Engineering Design	Ethical Decisions in Engineering Practice: How Will You Choose?	The Bearing Necessities: Foundation Considerations
Celebration 7–8	—	<b>QUAKETEK:</b> Seismic design and retrofit with friction dampers; a step-by-step guide, from analysis to testing	<b>HILTI:</b> Get What You Spec: Reliability from Design to Inspection
Celebration 9–10	Expanding the SE's Role – From Design Engineer to Trusted Advisor – A Case Study	Growing as a Manager: Challenging the "This is always how I've done it method"	Civil Engineering Global Practice: Challenges & Opportunities
Celebration 12–13	—	Wood Understood	A New Standard for Mitigation of Disproportionate Collapse

Room	SPECIAL SESSIONS – 3:30 P.M.–5:00 P.M.
Regency R	<b>Grenfell Tower Fire – The Consequences for Safety</b>
Bay Hill 17–18	<b>Science Not Communicated is Science Not Done</b> – Sponsored by
Bay Hill 25–26	<b>Joint SEI / IStructE Workshop on Conceptual Design of Bridges and Structures</b>

The popular Innovative Executive Sessions (IES) offer a dynamic experience to learn and earn PDHs. Presenters showcase their work in a very short presentation and then have time to interact directly with attendees.

**NEW!** Participate in a Vendor session to obtain real world examples and knowledge you can use to improve your job – no PDHs provided.

Use the Conference app to view session details and rate the sessions you attend. A paper copy of session details is also available at registration.



6:00 a.m.

## RUNNERS

Hyatt Regency Lobby

Participate in a 3–5 mile run – [cherylyn.henry@gmail.com](mailto:cherylyn.henry@gmail.com)

7:00 a.m. – 5:00 p.m. (Closed from 1:45 p.m.–2:45 p.m. for lunch)

## REGISTRATION

Windermere Foyer

7:30 a.m. – 8:00 a.m.

## COFFEE AND TEA

Regency R Foyer

8:15 a.m. – 9:15 a.m.

## PLENARY PROGRAM, SEI ANNUAL MEETING AND KEYNOTE SPEAKER

Regency R



Hear about SEI Vision and initiatives at the SEI Annual meeting followed by Keynote Speaker **Ashraf Habibullah** on “Structural Engineering: Indispensable to Civilization – So Why Don’t We Have More Influence? Why Don’t We Make More Money?”

It is a fact that a structural engineering education is focused almost exclusively on technical topics with practically no exposure to human engineering. Could that be the reason why structural engineers do not even begin to reflect the profession’s immeasurable contributions to humanity? And why our profession is not even in the running for any high-profile recognition or prize, such as a Nobel?

This is a presentation that will change your perspective – forever – on everything you thought you knew about our noble profession!

Ashraf Habibullah, Registered Civil & Structural Engineer, is President and CEO of Computers and Structures, Inc. (CSI). CSI is recognized globally as the pioneering leader in software tools for structural and earthquake engineering.



9:30 a.m. – 10:30 a.m.

## CONCURRENT TECHNICAL SESSIONS

Hyatt Regency Orlando

10:00 a.m. – 3:30 p.m.

## EXHIBIT HALL

Windermere WXYZ

10:30 a.m. – 11:00 a.m.

## REFRESHMENT BREAK IN EXHIBIT HALL

Windermere WXYZ

11:00 a.m. – 12:30 p.m.

## CONCURRENT TECHNICAL SESSIONS

Hyatt Regency Orlando

12:30 p.m. – 1:30 p.m. (Ticket Required)

## EXHIBIT HALL LUNCH

Windermere WXYZ

1:30 p.m. – 3:00 p.m.

## CONCURRENT TECHNICAL SESSIONS

Hyatt Regency Orlando

3:00 p.m. – 3:30 p.m.

## REFRESHMENT BREAK IN EXHIBIT HALL

Windermere WXYZ

3:30 p.m. – 5:00 p.m.

## CONCURRENT TECHNICAL SESSIONS

Hyatt Regency Orlando

3:45 p.m. – 7:00 p.m.

## EXHIBITORS MOVE-OUT

6:30 p.m. – 11:00 p.m.

## SPECIAL EVENING RECEPTION CELEBRATING THE FUTURE OF STRUCTURAL ENGINEERING\*

Hilton Orlando – Orange Ballroom & Fountain Plaza  
6001 Destination Parkway



### \*Additional ticket required

Ticket proceeds fund SEI strategic initiatives through the SEI Futures Fund in partnership with the ASCE Foundation.

Pre-purchased tickets required, no onsite ticket sales. Minimum age to attend 18. Business or cocktail attire recommended.

Sponsored by




## STRUCTURES CONGRESS 2019 PROCEEDINGS


Eligible conference registrants can claim the complete collection of proceedings papers through the ASCE Library for 60 days, beginning April 25, 2019. Please refer to the postcard you received with your registration packet for instructions on how to claim your proceedings.

Please visit the ASCE Bookstore (booth #325) if you need assistance.

Your first step in accessing the online proceedings is to register with the ASCE Library. If you’re not already a registered ASCE Library user, register today at <https://ascelibrary.org>.

Room	Concurrent Technical Sessions 9:30 a.m. – 10:30 a.m.	Concurrent Technical Sessions 11:00 a.m. – 12:30 p.m.	Concurrent Technical Sessions 1:30 p.m. – 3:00 p.m.	Concurrent Technical Sessions 3:30 p.m. – 5:00 p.m.
Regency R	—	Behavior and Design of Diaphragms, Chords, and Collectors for Steel Buildings	Structural Optimization in Everyday Design Tasks	Diverse & Illustrative Bridge Case Studies
Bay Hill 17–18	"CASE Contracts Committee Report: What the Practicing Engineer Needs to Know"	Building Movement: Whose Responsibility is it?	Seismic Resiliency and Reconnaissance Efforts	Virtual   Augmented   Hybrid – The New Realities in Structural Engineering
Bay Hill 25–26	Structural Engineering for Fun	Effect of Climate Change on Life-Cycle Performance of Structures and Infrastructure Systems	Industrial Facilities Require Sophisticated Solutions	Sharing Claim and Near Miss Experiences
Bay Hill 19–20	 Bridge Bearings, Testing, Analysis & FRP Topics	 Seismic Performance of Bridge Structures	 Steel, Pre-Stress & Post-Tensioning Bridge Topics	 The Future of Structural Sensing
Bay Hill 21–22	Creating Structural Resiliency	Become an Agent of Change and Innovation	Strong Leadership, Ethics, and Inclusivity Drive Corporate Culture to New Heights	Preserving Urban Character – Structural Renovations and Retrofits of Historic Buildings
Bay Hill 23–24	Fiber Reinforced Concrete & Mix Designs for Bridges	State of the Practice Bridge Inspection & Monitoring	Evaluation, Repair & Strengthening of Bridges & Tunnels after Natural, Accidental and Man-Made Hazards	Monitoring and Evaluation of Bridges using Mobile Sensing Technologies in Smart Cities
Bay Hill 29–30	Is Your Component Qualified?	Wind Effects on Solar Panels on Roofs	How to Model Nonstructural Components	Crack detection of civil infrastructure
Bay Hill 31–32	Design and Construction Lessons and Considerations	Educating the Profession: The role of adjuncts in blurring the Boundaries	Innovative Engineering Research from Florida Universities	Innovations in Structural Engineering Education – Teaching Structural Fire Engineering
Celebration 1–2	What Structural Engineers need to know about Historic Masonry	 Blast Design of Structures	 Blast Analysis of Industrial Structures	 Seismic Hazard Assessment, Risk and Loss Estimation
Celebration 3–4	—	 Stability Design Issues and Innovations of Steel Structures	 Recent Research and Development of Modular Construction Using Cold-Formed Steel	 Steel Analysis & Design
Celebration 5–6	Business of BIM Debate	Lawyers' Roundtable: Minimizing Risk through On-the-Job Practices and Procedures	Unleashing the Profession: How Performance Based Design Will Shape Our Future	Failure: When Engineers Make Mistakes
Celebration 7–8	 <b>DLUBAL SOFTWARE INC. – Vendor Session:</b> Nonlinear Time History Analysis in RFEM with Machine Induced Vibrations	NSF I/UCRC Wind Hazard and Infrastructure Performance (WHIP)	Damage Reconnaissance in the Aftermath of Hurricane Harvey and Lessons Learned from Collected Data.	Hurricane Engineering: Past, Present, and Future
Celebration 12–13	State of Practice: Bridge Security Design Criteria and Tools	Performance-Based Approach to Structural-Fire Safety: Challenges and Opportunities	The Nature of Structures: Biomimicry in Structural Design and Analysis	Rehabilitation, Renovation, and Retrofit: Building Case Studies

 The popular Innovative Executive Sessions (IES) offer a dynamic experience to learn and earn PDHs. Presenters showcase their work in a very short presentation and then have time to interact directly with attendees.

 PDH credit for the DLUBAL SOFTWARE SESSION will be issued through Dlubal Software, not ASCE.

Use the Conference app to view session details and rate the sessions you attend. A paper copy of session details is also available at registration.



**6:00 a.m.**

**RUNNERS**

**Hyatt Regency Lobby**

Participate in a 3–5 mile run –  
[cherylyn.henry@gmail.com](mailto:cherylyn.henry@gmail.com)

**7:00 a.m. – 10:00 a.m.**

**REGISTRATION**

**Windermere Foyer**

**7:30 a.m. – 8:00 a.m.**

**COFFEE AND TEA**

**Regency R Foyer**

**8:00 a.m. – 9:30 a.m.**

**CONCURRENT TECHNICAL SESSIONS**

**Hyatt Regency Orlando**

**9:30 a.m. – 10:00 a.m.**

**REFRESHMENT BREAK**

**Windermere Foyer**

**10:00 a.m. – 11:30 a.m.**

**CONCURRENT TECHNICAL SESSIONS**

**Hyatt Regency Orlando**

**11:30 a.m. – 1:45 p.m.**

**CLOSING PLENARY LUNCHEON, AWARDS PROGRAM, AND KEYNOTE SPEAKER**

**Regency R**



Celebrate the achievement of this year's SEI and ASCE award winners and hear from ASCE President Robin Kemper. Dine with colleagues and hear an outstanding keynote speaker, **Scott Mallwitz**, Executive Creative Director, *Walt Disney Imagineering* on "Reimagining Fantasyland at Magic Kingdom Park".

The 2012 Fantasyland Expansion in the Magic Kingdom at Walt Disney World Resort doubled the overall themed land. Learn how this expansion was conceptualized, developed and engineered – including the innovative solutions that seamlessly built upon the original Magic Kingdom infrastructure. As an Executive Creative Director for Walt Disney Imagineering, Scott is responsible for overseeing the strategic development and conceptual design of Star Wars Galaxy's Edge at Disney's Hollywood Studios. Throughout his 30-year career working on theme parks, museum exhibitions, visitor centers, resorts and Olympic Games, he has focused on the creation of physical spaces and emotional connections – dimensional, immersive and experiential storytelling – to realize compelling guest experiences. His Disney portfolio includes the Magic Kingdom Fantasyland expansion at Walt Disney World Resort and other transformative projects.

**Tickets are required for the Saturday Luncheon.**

*Please arrive on time. Late attendees are not guaranteed a meal.*

**Joint International Conference:**

Collaboration · Efficiency · Safety

**Dubai, UAE | 29-30 September 2019**

## Iconic Global Structures: what can we learn?

Join structural engineers and project stakeholders to explore the successes and challenges of constructing nine complex structures across the world. Keynote speakers will share their experience of high volume occupancy, unusual structures where typical codes do not apply, and performance based design (PBD) of tall buildings.



Register now to receive early booking discount:  
<https://structuresdubai2019.cvent.com>


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Engineers



STRUCTURAL  
ENGINEERING  
INSTITUTE



Room	Concurrent Technical Sessions 8:00 a.m. – 9:30 a.m.	Concurrent Technical Sessions 10:00 a.m. – 11:30 a.m.
Bay Hill 17–18	Enchanting New Design: Building Case Studies	2018 IBC Significant Structural Changes
Bay Hill 25–26	Advances in Information Technology for Structural Engineering Under Natural Hazards	Concrete Kingdom: Advances in Behavior and Strength
Bay Hill 19–20	Research in Concrete Buildings and Bridges	—
Bay Hill 21–22	Leading and Learning from Teams of the Future (and Today)	BIM Contracts: Risky or Risk Management Tool?
Bay Hill 23–24	Life-Cycle Analysis Applications in Bridge and Tunnel Inspections	Assessment and Repair of Deteriorated Steel Infrastructure
Bay Hill 29–30	Design and Construction of Cable-Supported Mega-Bridges: Case Studies	Alternative Load Path Analysis Guidelines for Disproportionate Collapse Design
Bay Hill 31–32	Structural Engineering Education – Case Studies and a Vision for the Future	It's an Old World After All: Improved Understanding of Existing Buildings
Celebration 1–2	 Recent Developments in Disproportionate Collapse	 Recent Efforts in Hurricane Engineering: Assessment, Mitigation and Recovery
Celebration 5–6	Structural Engineering Licensures - the Pros, Cons, and Status	Masonry Research
Celebration 7–8	Loads 'N Codes: Upping the Ante for Building Load Determination	—
Celebration 9–10	From Research to Practice – How the Timber Industry Incorporates State-of-the-Art Research in Practice	Preparing the Next Generation of Structural Engineers to Design for Sustainability and Resilience

 The popular Innovative Executive Sessions (IES) offer a dynamic experience to learn and earn PDHs. Presenters showcase their work in a very short presentation and then have time to interact directly with attendees.

Thank you to SEI Volunteer Committees for planning Structures Congress 2019.

## LOCAL PLANNING COMMITTEE

### Co-Chairs

- Joe Ales, P.E., F.SEI, M.ASCE, Walter P. Moore & Associates
- Kevin Casey, P.E., S.E., F.SEI, F.ASCE, BBM Structural Engineers
- Charlotte Insull, P.E., M.ASCE, Walter P. Moore & Associates
- Mauricio Lopez, Walter P. Moore & Associates
- Michael Seaman, P.E., M.ASCE, Walt Disney Imagineering

### Members

- Erica Bourdage, P.E., M.ASCE, Walt Disney Imagineering
- Necati Catbas, Ph.D., P.E., F.SEI, F.ASCE, University of Central Florida
- Bora Erbelin, P.E., S.E., M.ASCE, BBM Structural Engineers
- Donna Friis, P.E., F.SEI, F.ASCE, Bracken Engineering
- Jennifer Zabik, P.E., F.SEI, M.ASCE, Zabik-Turner Engineering

## NATIONAL TECHNICAL PROGRAM

### Committee Chair

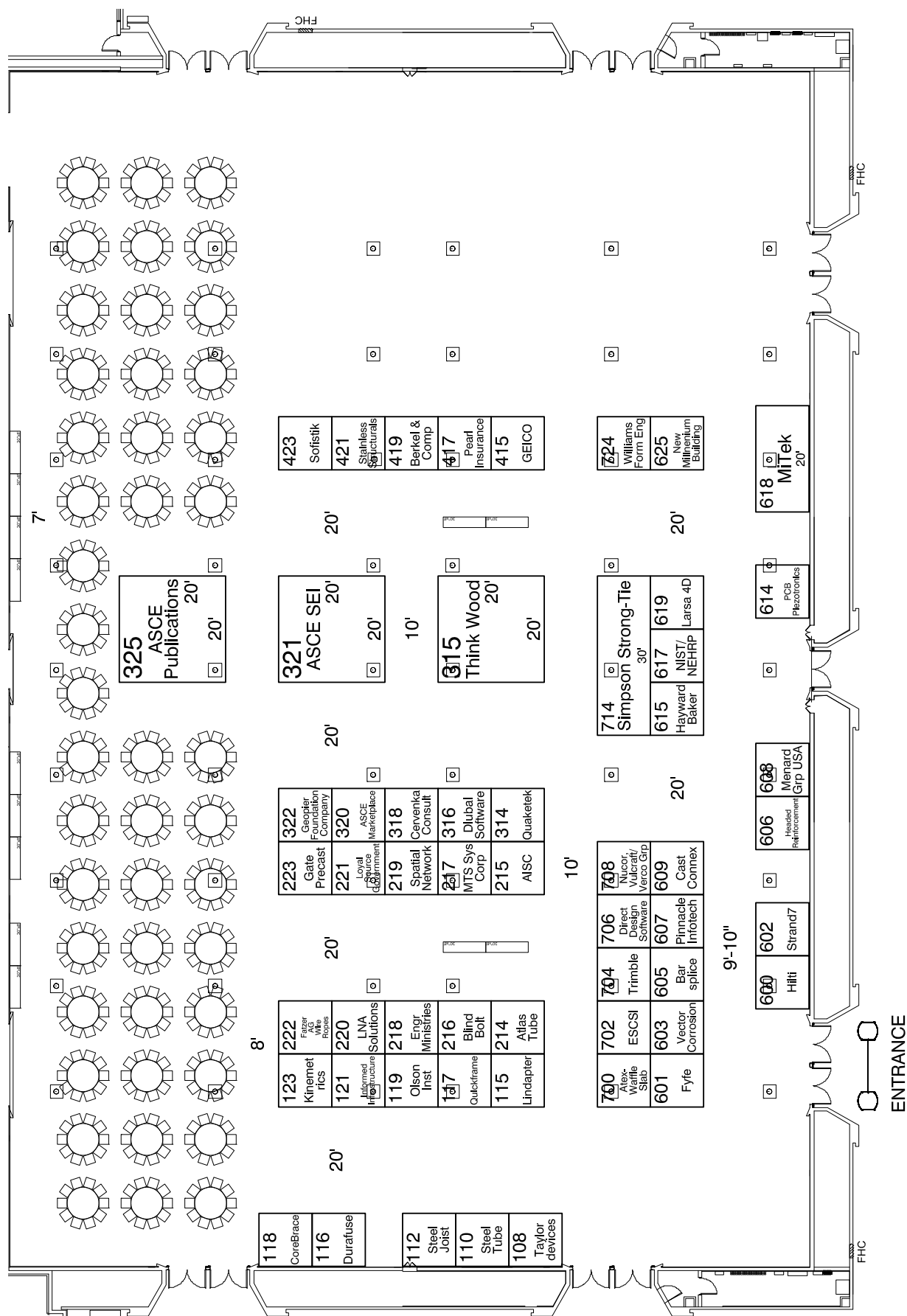
- James Gregory Soules, P.E., S.E., P.Eng., SECB, F.SEI, F.ASCE, McDermott

### Members

- Hossam M. Abdou, Ph.D., P.E., S.E., M.ASCE, Alfred Benesch & Company
- Nicole Baer, P.E., F.SEI, M.ASCE, Hope Furrer Associates
- Jeremy Isenberg, Ph.D., P.E., NAE, F.SEI, Hon.M.ASCE, Stanford University
- Takahiko Kimura, P.E., F.SEI, M.ASCE, Jacobs Engineering Group
- Brian Leshko, P.E., F.SEI, F.ASCE, HDR Engineering, Inc.
- Mustafa Mahamid, Ph.D., P.E., S.E., F.SEI, F.ASCE, University of Illinois at Chicago
- Shalva Marjanishvili, P.E., S.E., F.SEI, M.ASCE, Hinman Consulting Engineers, Inc.

- Brian McElhatten, P.E., S.E., M.ASCE, ARUP
- Bruce Peterson, P.E., F.SEI, F.ASCE, Modjeski and Masters (Retired)
- John Francis Silva, P.E., S.E., F.SEI, M.ASCE, Hilti Inc.
- Robert Smilowitz, Ph.D., P.E., F.SEI, M.ASCE, Thornton Tomasetti
- John Tawresey, P.E., S.E., F.SEI, Dist.M.ASCE, KPFF Consulting Engineers – Retired
- Sarah Vaughan Cook, P.E., S.E., M.ASCE
- Mark Waggoner, P.E., M.ASCE, Walter P. Moore & Associates
- Eric Williamson, Ph.D., P.E., F.SEI, M.ASCE, University of Texas at Austin





**BOOTH 215****AMERICAN INSTITUTE OF STEEL CONSTRUCTION**

AISC, headquartered in Chicago, is a non-partisan, not-for-profit technical institute and trade association established in 1921 to serve the structural steel design community and construction industry in the U.S.

**BOOTH 325****ASCE PUBLICATIONS**

ASCE Publications provide state-of-the practice information and guidance on today's engineering methods and technologies, from design and planning through application in the field. Coverage encompasses all civil engineering content areas, including construction, structures, transportation, geotechnics, environment, water resources, and professional practice. Stop by the ASCE Bookstore for a chance to win a FREE 6-month individual subscription to ASCE 7 Online.

**BOOTH 321****ASCE/SEI**

SEI advances members' careers, stimulates technological advancement, and improves professional practice. SEI drives the practical application of cutting-edge research by improving coordination and understanding between academia and practicing engineers. Stop by to check out membership benefits and opportunities. Learn about SEI efforts and how you can join them to advance your career and the profession.

**BOOTH 320****ASCE MARKETPLACE**

Show pride in your profession with ASCE and SEI branded gear! Stop by the ASCE Marketplace booth and shop the latest selection of apparel, children and pet items, office accessories, and more.  
<http://www.asce.org/giftstore>

**BOOTH 700****ATEX – WAFFLE SLAB**

A Market leader in ribbed slab market in the Americas, Atex offers +120 different types of waffle and pan joist plastic forms which are productive and can be reused +200x.

**BOOTH 214****ATLAS TUBE**

Atlas Tube is the leading producer of Hollow Structural Sections (HSS) in North America, including A1085, A500 and Jumbo HSS.

**BOOTH 605****BARSPLICE**

Barsplice is a manufacturer of engineered mechanical splices for reinforced concrete construction and ACI 318 Type 1 and Type 2 strength applications.

**BOOTH 419****BERKEL & COMPANY CONTRACTORS**

A specialty design-build contractor offering Augered Pressure Grouted (APG) and Drilled Displacement (APGD) Piles, Ground Improvement, Sheet piling & Shoring, Underpinning, Anchors, Driven Piles & Drilled Shafts. Full in-house engineering and design services are available.

**BOOTH 216****BLIND BOLT CO**

The Blind Bolt Co. offers innovative solutions to bolting directly into hollow steel sections or anywhere where you don't have access on the backside or can't weld.

**BOOTH 609****CAST CONNEX**

CAST CONNEX is a supplier of off-the-shelf cast steel structural connection solutions and also designs and supplies custom cast steel nodes and components for use in building and bridge structures.

**BOOTH 318****CERVENKA CONSULTING**

Cervenka Consulting is developing software ATENA, a leading simulation tool for realistic modeling of reinforced concrete structures and provides related consulting services.

**BOOTH 118****COREBRACE**

CoreBrace buckling-restrained braces (BRB) are a sustainable and cost-effective solution to improve the seismic performance and resiliency of new and retrofit structures. Ask us how.



**BOOTH 706****DIRECT DESIGN SOFTWARE**

Comprehensive masonry design software that dramatically reduces the time required to engineer single- and multi-story buildings. Compliant with IBC, TMS 402, and ASCE 7.

**BOOTH 316****DLUBAL SOFTWARE**

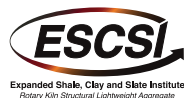
Providing powerful yet user-friendly structural analysis and design software. Our non-linear FEA program includes USA/International standards for steel, concrete, timber, cross-laminated timber (CLT), aluminum, glass, and fabric form-finding for every design engineer.

**BOOTH 116****DURAFUSE**

A DuraFuse Frame is a highly-optimized Moment Frame. The beams are connected to the columns via plates and bars. The connection is designed such that the fuse plate protects the beam and column during earthquake loading.

**BOOTH 218****ENGINEERING MINISTRIES INTERNATIONAL**

Engineering Ministries International is a group of volunteer engineers, architects and land surveyors who offer technical design service to Christian organizations in developing countries that want to build something complicated enough to require technical expertise. The service is offered on short-term mission trips of 1–2 weeks.

**BOOTH 702****EXPANDED SHALE, CLAY AND SLATE INSTITUTE**

ESCSI is the international trade association for manufacturers of rotary kiln-produced expanded shale, expanded clay and expanded slate lightweight aggregate.

**BOOTH 222****FATZER AG WIRE ROPES**

The starting point for FATZER products is high-tensile steel wire. Fabricated into steel wire ropes, it enables architects, engineers and contractors to create technically sophisticated rope architecture.

**BOOTH 601****FYFE COMPANY**

Fyfe Company developed the Tyfo Fibrwrap Systems for the retrofit and repair of our infrastructure. We provide engineering support and coordinate directly with our applicators.

**BOOTH 223****GATE PRECAST COMPANY**

Gate Precast Company operates nine manufacturing facilities with the most diverse product lines of prefabricated concrete systems for structures. With a delivery area encompassing over two-thirds of the United States, Gate Precast maintains its reputation for superior quality while continuously engaging with academia, design-assist partners and others in the construction industry to research and develop innovative prefabricated products and finishes for the built environment. With that focus, Gate Precast provides: designers greater freedom through a resilient product; owners more cost certainty through lower life-cycle costs; and builders an accelerated project schedule on cleaner, safer job-sites. Our many award-winning projects embody this focus.

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**BOOTH 322****GEOPIER FOUNDATION COMPANY**

Geopier provides an efficient and cost-effective Intermediate Foundation® solution for the support of structures. Specializing in Rammed Aggregate Pier®, Rigid Inclusions, and slope reinforcement systems.

**BOOTH 615****HAYWARD BAKER**

Hayward Baker, North America's leader in geotechnical solutions, offers solutions for ground improvement, earth retention & shoring, foundation repair & underpinning, liquefaction mitigation, deep foundations, and groundwater control.



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## BOOTH 606

### HEADED REINFORCEMENT CORP

High Performance Reinforcement Products for Structural Integrity and Constructability



## BOOTH 220

### LNA SOLUTIONS

LNA Solutions is the premier supplier of steel-to-steel connection products including Seismic Approved BoxBolt® Expansion Anchors. Trust LNA products for every structural steel construction application.



## BOOTH 600

### HILTI

Hilti provides leading-edge technology to construction professionals. Hilti products, systems and services offer innovative solutions with outstanding added value to customers in the construction industry.



## BOOTH 221

### LOYAL SOURCE GOVERNMENT SERVICES

Loyal Source is leading provider of Architecture and Engineering recruiting services nationwide. Today's business environment is complex and the competition for qualified talent is fierce. The best candidates could be across town or across the country. As Professional Recruiters, we have the know-how to help you think in new ways about how to identify, recruit and retain top talent.



## BOOTH 121

### INFORMED INFRASTRUCTURE

The tools, products, and technologies for improved project delivery are evolving rapidly. Engage now with *Informed Infrastructure*, your news source that delivers actionable information for improving the design and delivery of water systems, energy, transportation, structures, and aligned infrastructure. Receive our magazine, and our weekly e-news and video alerts.



## BOOTH 608

### MENARD GROUP USA

The latest steel-to-steel connections; the popular Hollo-Bolt expansion bolt with ICC seismic approval, plus the Girder Clamp, set to become the world's first approved clamp system!



## BOOTH 123

### KINEMATRICS

For 50 years, Kinemetrics has been the global leader in earthquake monitoring. Now proud to offer OasisPlus – a complete earthquake response solution for buildings.



## BOOTH 618

### MITEK

MiTek Builder Products, a division of MiTek USA, Inc. serves the construction industry with an extensive offering of innovative products and solutions across a full range of structural connections and design tools.



## BOOTH 619

### LARSA, INC

LARSA 4D analysis and design software addresses the specialized needs of bridges and structures that require robust staged construction, advanced analysis, or geometric and material nonlinearity.



## BOOTH 217

### MTS SYSTEMS CORPORATION

MTS is a leading global provider of mechanical test and simulation solutions used to study building materials, components and civil structures in controlled laboratory settings



## BOOTH 115

### LINDAPTER

The latest steel-to-steel connections; the popular Hollo-Bolt expansion bolt with ICC seismic approval, plus the Girder Clamp, set to become the world's first approved clamp system!





## BOOTH 625

### NEW MILLENNIUM BUILDING SYSTEMS



New Millennium engineers and manufactures a complete range of steel building systems and bridge deck systems. Systems range from standard steel joists and deck to architecturally unique steel joist and deck solutions, including long-span composite floor systems for dramatic cost savings to the building owner. The company is a leader in BIM based design for steel joists and decking.

## BOOTH 617

### NIST/NEHRP



The National Earthquake Hazards Reduction Program (NEHRP) was established by Congress in 1977 to reduce risks to life and property from future United States earthquakes.

## BOOTH 708

### NUCOR, VULCRAFT/VERCO GROUP



The Vulcraft/Verco Group, a part of Nucor Corporation, is the nation's largest manufacturer of steel joists, joist girders and steel deck.

## BOOTH 119

### OLSON INSTRUMENTS



Olson Instruments, Inc. manufactures Nondestructive Evaluation instrumentation used in the construction field. Olson designs, assembles, field tests, and distributes world class NDE testing equipment.

## BOOTH 614

### PCB PIEZOTRONICS



PCB Piezotronics, Inc., a wholly owned subsidiary of MTS Systems Corporation, is the market leader in sensing technologies and committed to Total Customer Satisfaction.

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Pinnacle Infotech has been the leading provider of innovative BIM services to the Architectural, Engineering and Construction Industries for more than 20 years.

## BOOTH 314

### QUAKETEK



Quaketek is a manufacturer of highly-efficient systems for earthquake protection and collaborates in seismic retrofits mainly with the implementation of seismic friction dampers.

## BOOTH 117

### QUICKFRAME



QuickFrames provides the only patented, pre-engineered, bolt-on, adjustable roof top opening frames for commercial buildings. Request a quote or schedule an NCSEA-accredited lunch & learn today!

## BOOTH 714

### SIMPSON STRONG-TIE



For over 60 years, Simpson Strong-Tie has focused on creating structural products that help people build safer and stronger homes and buildings. [www.strongtie.com](http://www.strongtie.com).



## BOOTH 423

### SOFISTIK



The German SOFiSTiK is one of the leading European suppliers of structural analysis and BIM software. SOFiSTiK was founded 1987 and is Autodesk® Industry Partner.

## BOOTH 219

### SPATIAL NETWORKS



Spatial Networks delivers data and technology products that enable organizations to identify opportunities, reduce uncertainty, and obtain valuable insights into their field operations.



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## BOOTH 421 STAINLESS STRUCTURALS AMERICA



Producer and Distributor of Stainless Steel Structural Profiles in Carbon Designations. We stock Beams, Channels, Angle and Tee. Larger Sizes and Custom Profile on Application.

## BOOTH 112 STEEL JOIST INSTITUTE



The Steel Joist Institute (SJI), a nonprofit organization of active joist manufacturers and other organizations and companies connected to the industry, was founded in 1928 to address the need for uniform joist standards within the industry.

## BOOTH 110 STEEL TUBE INSTITUTE



A non-profit organization of manufacturers whose goal is to inform customers about the utility and versatility of structural steel tubing while promoting and marketing their product.

## BOOTH 602 STRAND7



Strand7 is an advanced, general purpose, FEA system used worldwide by engineers and analysts for a wide range of structural analysis applications comprising preprocessing, solvers (linear, nonlinear static/dynamic, thermal), postprocessing and customization via API. With all features, solvers and modules tightly integrated together under one state of the art graphical interface and all modules working in the same, consistent and efficient manner, Strand7 is easy to learn and easy to use.

## BOOTH 108 TAYLOR DEVICES



Taylor Devices' commitment to excellence & quality has positioned the company as the world leader in shock & vibration control solutions since 1955.

## BOOTH 315 THINK WOOD



Think Wood promotes the benefits of wood construction across building applications. We offer resources, handbooks and other tools for engineers, contractors, researchers, developers, and architects.

## BOOTH 704 TRIMBLE



Trimble and ADAPT have partnered together to integrate a revolutionary 3D Steel/Concrete Analysis and Design solution with the leading tool for post-tensioned concrete slab design

## BOOTH 603 VECTOR CORROSION



Vector Corrosion Technologies has innovative solutions for concrete corrosion repair and protection in reinforced concrete structures including: embedded galvanic anodes, galvanic jackets, activated arc-spray zinc metallizing, corrosion detection and evaluation, repair and mitigation services for post-tension corrosion.

## BOOTH 724 WILLIAMS FORM ENGINEERING CORP



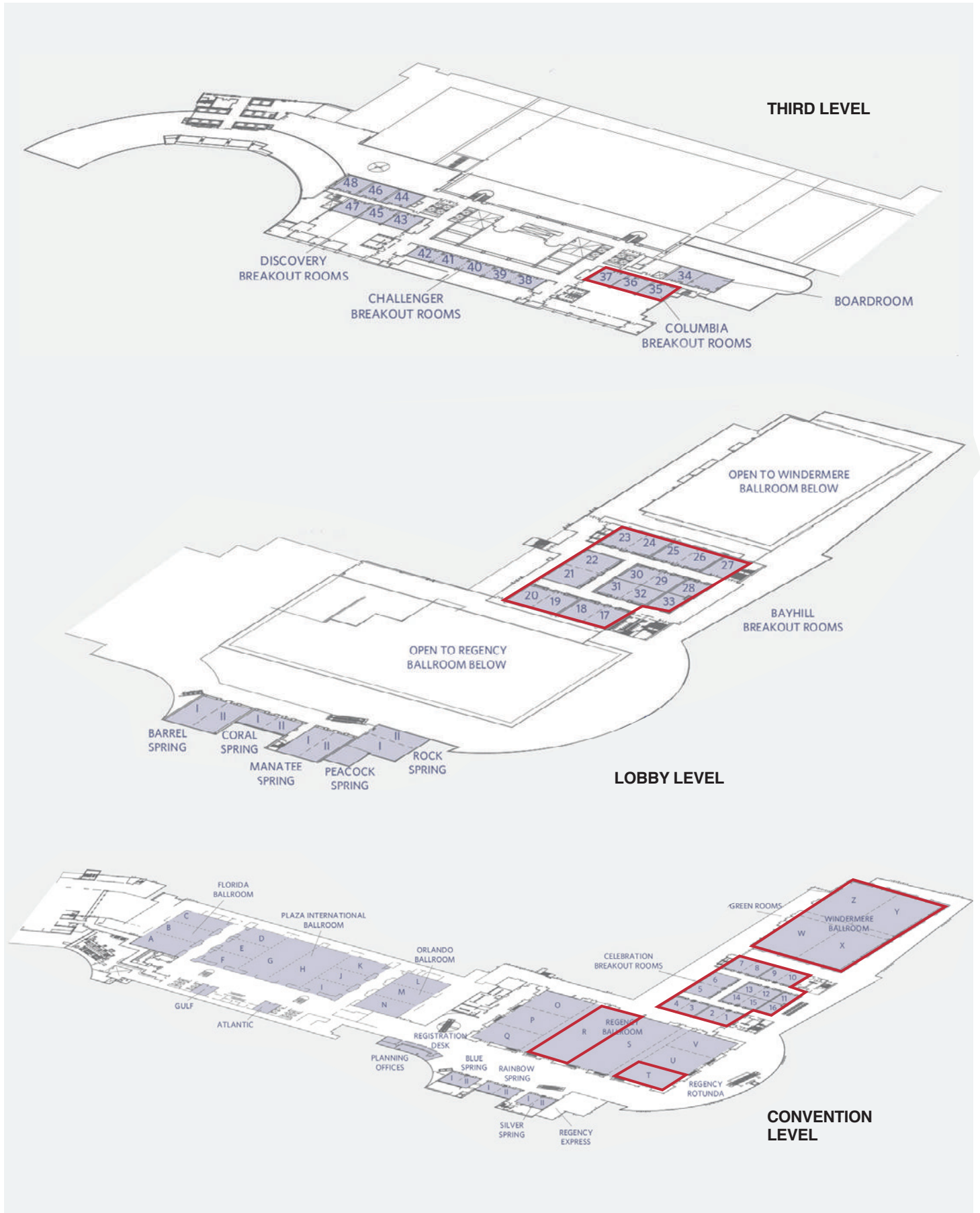
Williams Form Engineering Corporation has been offering Ground Anchors, Concrete Anchors, Post Tensioning Systems, and Concrete Forming Hardware to the construction industry for over 95 years.



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## ASSUMPTION OF RISK

All ASCE events and activities are purely voluntary activities, and attendees are fully responsible for their own conduct and well-being, including, and without limitation, determining their level of fitness to take part in any such event or activity. In participating in any event or activity, attendees shall be deemed to understand and accept all risk of possible physical injury that might occur as a result of such participation. Children under the age of 18 are not allowed in the Exhibit Hall.

## MEDICAL EMERGENCIES

We hope that your visit to Structures Congress 2019 will be free from illness or injury, but in case you or a family member needs medical attention during your time at the event, contact the front desk. For life-threatening emergencies, such as chest pain, shortness of breath, or severe abdominal pain, call 911. The closest hospital is Dr. Phillips Hospital

- 9400 Turkey Lake Road  
Orlando, Florida, 32819  
(407)351-8500

## MEETING ROOM OVERCROWDING

ASCE will make every effort to schedule popular events in rooms large enough to accommodate anticipated attendance. Since many events are extremely popular, it is wise to select alternative events as you plan your conference schedule. ASCE and the Hyatt Regency are REQUIRED to follow local fire regulations and may ask participants in rooms filled to capacity to choose another event.

## NO SMOKING POLICY

Smoking is not allowed at any ASCE event or in the hotel.

## NURSING MOTHER'S ROOM

To better serve nursing mothers attending this year's Structures Congress, the Green Room will be available during all regular events including plenary, technical & special sessions, meals and breaks. See registration staff for directions on how to access room. We hope that you find this room comfortable and useful.

## PROGRAM AND SESSION CANCELLATION

ASCE reserves the right to cancel programs and/or sessions. In the unlikely event of a cancellation, all registrants will be notified. Programs and sessions are subject to change, and ASCE reserves the right to substitute a program, session, and/or speaker of equal caliber to fulfill the educational requirements.

## PHOTOGRAPHS AND VIDEO

Photographs and Video of the event may be taken by ASCE, its agents, contractors, or representatives, and such photographs and video may be used for any purpose at ASCE discretion.

## DIVERSITY AND INCLUSION

The ASCE policy of Diversity and Inclusion fosters a culture that encourages the free expression and exchange of engineering ideas by all members, regardless of gender, race, ethnic origin, religion, age, marital status, sexual orientation, disabilities, or any other reason not related to scientific or technical merit.

## DINING OPTIONS

- **Hyatt Regency** – Our official venue is home to seven different dining experiences, ranging from casual to comfort and convenience. Feel free to dine indoors, outdoors, in your room, or stop by their 24-hour Market for a quick bite to eat.
- **ICON Orlando** – Located just a mile away from the hotel are 12 full-service restaurants.
- **Show Your Badge** – Receive discounts. Visit [www.structurescongress.org/location](http://www.structurescongress.org/location) and click on show your badge for details.



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## ORLANDO, FL

### Plenary Program: "Structural Engineering is Indispensable to Civilization. So Why Don't We Make More Money? "

It is a fact that a structural engineering education is focused almost exclusively on technical topics with practically no exposure to human engineering. Could that be the reason why our professional fees and compensation do not even begin to reflect the profession's immeasurable contributions to humanity? And why our profession is not even in the running for any high-profile recognition or prize, such as a Nobel? Come hear Ashraf Habibullah consider these pressing questions and offer a fresh perspective on everything you thought you knew about our noble profession!

Friday, April 26, 2019 - 8:15 AM  
Hyatt Regency Orlando - Regency R

**Keynote Speaker: ASHRAF HABIBULLAH**  
President and CEO, Computers & Structures, Inc.

### After-Party: A Celebration of Structural Engineering

Friday evening, join us for an unforgettable evening hosted by Ashraf Habibullah to celebrate the invaluable contributions of the structural engineering profession to humanity. Dinner will be served, and don't forget your dancing shoes! The Ashraf All-Stars will play your favorite hits from the 80s, 90s, and beyond. Dress to impress! Evening attire recommended: Sport coat for men, cocktail dress or slacks for women. Please, no jeans, shorts, t-shirts, flip flops, or tennis shoes.

**After-party open to all congress registrants and their guests. Tickets Required. Proceeds benefit the SEI Futures Fund.**

Friday, April 26, 2019 - 6:30 PM  
Hilton Orlando - Orange Ballroom  
& Fountain Plaza

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