FINAL PROGRAM

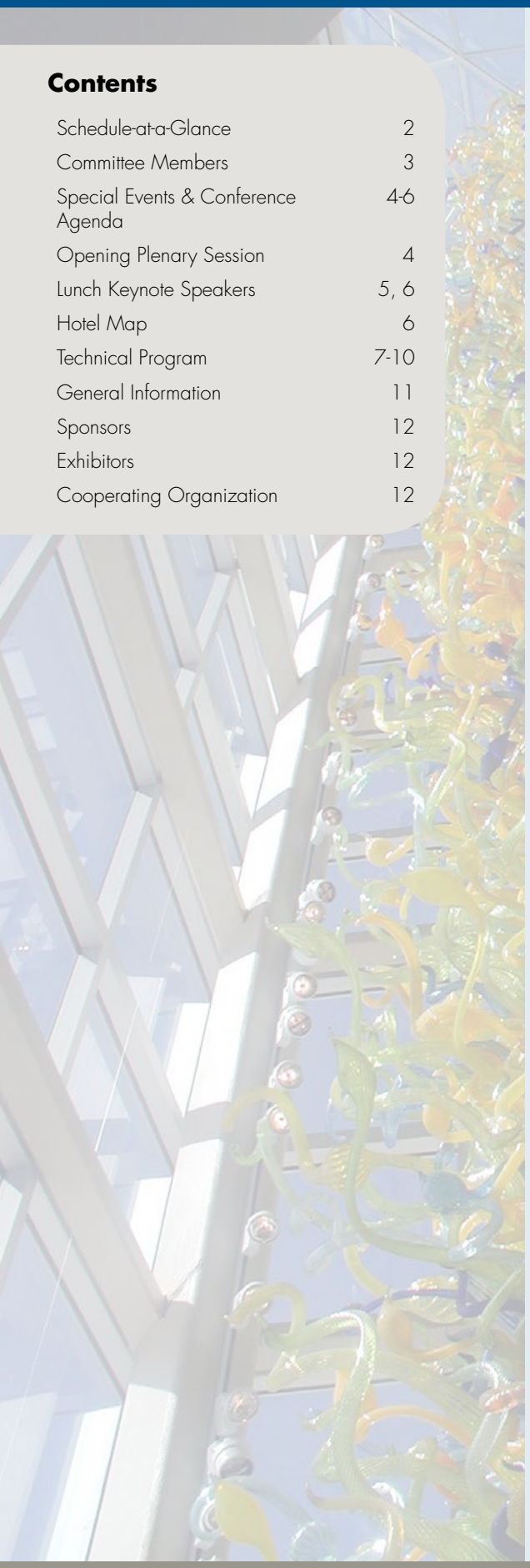
Architectural Engineering Institute Conference 2017

Oklahoma City, Oklahoma | April 11-13, 2017

Resilience of the Integrated Building: A Community Focus

www.aei-conference.org

Contents



Schedule-At-A-Glance

(Subject to Change)

Tuesday, April 11

12:00 – 7:00 p.m.	Registration

Wednesday, April 12

7:00 a.m. – 7:00 p.m.	Registration
7:30 a.m. – 8:00 p.m.	Exhibit Hours
7:30 – 8:30 a.m.	Continental Breakfast
8:00 a.m. – 5:00 p.m.	Student Design Competition
8:30 – 10:00 a.m.	Opening Keynote Plenary
10:00 – 10:30 a.m.	Morning Networking Break
10:30 a.m. – 5:00 p.m.	Concurrent Sessions
12:00 – 1:30 p.m.	Networking Lunch
3:00 – 3:30 p.m.	Afternoon Networking Break
6:00 – 8:00 p.m.	Welcome Reception

Thursday, April 13

7:00 a.m. – 6:00 p.m.	Registration
7:30 a.m. – 3:30 p.m.	Exhibit Hours
7:30 – 8:30 a.m.	Continental Breakfast
8:00 a.m. – 4:15 p.m.	Concurrent Sessions
9:30 – 10:00 a.m.	Morning Networking Break
11:30 a.m. – 1:00 p.m.	Keynote Luncheon
2:30 – 2:45 p.m.	Afternoon Networking Break
4:15 – 5:15 p.m.	AEI Professional Project Awards Presentations
6:30 – 9:00 p.m.	Awards Banquet

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Engineering of Structures and Building Enclosures

Dear Friends and Colleagues,

It is a great pleasure and a distinct honor to extend to you a warm welcome to AEI's 7th biennial professional conference here in Oklahoma City, Oklahoma. The theme of the conference is **"Resilience of the Integrated Building: A Community Focus."** I invite you to exchange ideas, discover opportunities, reacquaint with colleagues, meet new friends, and broaden your knowledge.

Our technical program is rich and varied with two keynote presentations, three panel discussions, and 104 technical presentations spread over two very full days. With contributions from academics and industry professionals, these presentations cover planning, design, construction, operation, and maintenance of buildings. In particular, I am very excited by the 12 presentations discussing new and innovative methods in architectural engineering education. I hope you also take time to observe a couple of the AEI Student Design Competition presentations on Wednesday.

While in Oklahoma City, I invite you to discover this Great Plains city. Just two blocks east of the hotel is the Bricktown Entertainment District. Formerly a major warehouse district, it is now home to more than 30 restaurants, bars, clubs, and retail shops, along with family-friendly attractions, museums, and galleries. Bricktown also contains the Chickasaw Bricktown Ballpark, home to the Triple-A Oklahoma City Dodgers baseball team and located at the corner of Mickey Mantle and Johnny Bench Drives. Just across from the Bricktown Ballpark is the entrance to the Bricktown Water Taxi where you can take a fun and informative ride along the Bricktown Canal. For those interested in history, the Centennial Land Run Monument is located at the south end of the Bricktown Canal and commemorates the opening of the Unassigned Land in Oklahoma Territory with the Land Run of 1889. The monument contains 45 heroic-size bronze sculptures of land run participants and is one of the largest freestanding bronze sculptures in the world, occupying a corridor that is longer than a football field.

In addition to Bricktown, Oklahoma City hosts a number of other interesting attractions. Just one block south and west of the hotel is the Myriad Botanical Gardens, a 17-acre botanical garden and interactive urban park, a key architectural component of the downtown area. The gardens include the Crystal Bridge Tropical Conservatory, an indoor multilevel conservatory with towering palm trees, tropical plants, flowers, waterfalls, and exotic animals. One block south and east of the Gardens is Chesapeake Energy Arena, home to the NBA's Oklahoma City Thunder basketball team. Finally, located a little over a half mile north and slightly west of the hotel is the Oklahoma City National Memorial and Museum, honoring the victims, survivors, and rescuers from the bombing of the Alfred P. Murrah Federal Building in 1995. The architect of the memorial, Hans Butzer, is giving Thursday's keynote luncheon presentation.

On behalf of the ASCE Architectural Engineering Institute and the University of Oklahoma, welcome to Oklahoma City and welcome to the **2017 AEI Conference**.

Jeffery S. Volz, Ph.D., P.E., S.E., M.ASCE,
University of Oklahoma
Conference Chair, AEI Conference 2017

Local Planning Committee

Conference Chair
Jeffery S. Volz, P.E., S.E., Ph.D., M.ASCE, University of Oklahoma, Norman, OK

Kevin Bahner, P.E., Wallace Engineering, Oklahoma City, OK

Gouranga Banik, Ph.D., P.E., F.ASCE, Oklahoma State University, Stillwater, OK

Alixandra Bradford, Henderson Engineers, Inc., Dallas, TX

Kasha Egan, P.E., Wallace Engineering, Oklahoma City, OK

Royce Floyd, Ph.D., P.E., University of Oklahoma, Norman, OK

Lisa Holliday, Ph.D., P.E., University of Oklahoma, Norman, OK

Michael Renes, P.E., LEED AP BD+C, Wallace Engineering, Oklahoma City, OK

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Moses D.F. Ling, P.E., The Pennsylvania State University, University Park, PA

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Cristina Charron, Manager, ASCE Conferences & Meeting Services

Drew Caracciolo, Manager, Exhibits and Sponsorship Sales

Special Events & **Conference Agenda**

TUESDAY, APRIL 11

Registration Hours
12:00 – 7:00 p.m., *Century Foyer*

Academic Council Meeting
8:00 – 11:00 a.m., *Red Carpet Room*

AEI Board of Governors Meeting
8:00 a.m. – 1:00 p.m., *Frontier Room*

Workshop For Student Chapter Leaders
11:00 a.m. – 2:00 p.m., *Great Plains Room*

Joint Meeting: AEI Board of Governors, Academic Council, and Executive Council Joint Meeting
1:00 – 5:00 p.m., *Plaza South Ballroom*

Student Design Competition Committee Meeting
8:00 – 10:00 p.m., *Frontier Room*

WEDNESDAY, APRIL 12

Registration Hours
7:00 a.m. – 7:00 p.m., *Century Foyer*

Exhibit Hours
7:30 a.m. – 8:00 p.m., *Century Foyer*

Continental Breakfast
7:30 – 8:30 a.m., *Century Foyer*

Student Design Competition
8:00 a.m. – 5:00 p.m., *Plaza North Ballroom*

Opening Plenary
8:30 – 10:00 a.m., *Century Ballroom*

KEYNOTE ADDRESS

Designing Community Networks To Support Resilient, Sustainable Buildings In Regions Of Risk

Louise K. Comfort, Ph.D., *Director, Center for Disaster Management, University of Pittsburgh*

As the number, frequency, and cost in lives and social disruption from natural hazards and disasters increase, the urgency of mobilizing collective action at the community level to build sustainable, resilient communities also increases. The challenge is to identify the factors that engage the whole community exposed to risk – public, private, nonprofit organizations, as well as household units – in sustainable programs of risk reduction, based on an informed understanding of risk coupled with practical guides to action. In this session participants will learn about a sociotechnical systems approach which identifies the set of interacting functions that are essential to maintain the resilience of a neighborhood, and focuses on the built environment as the physical context within which economic and social activity occurs.

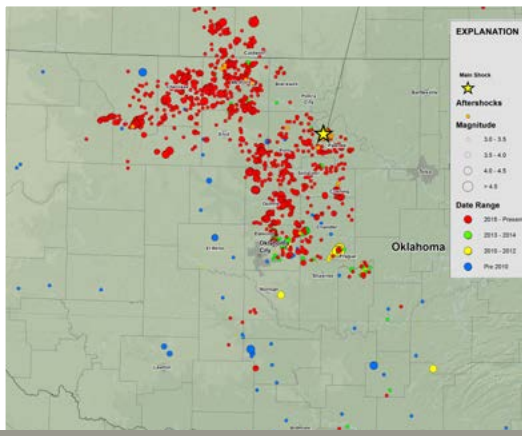
Concurrent Sessions
10:30 a.m. – 5:00 p.m.

Track 1 - Plaza South Ballroom

Track 2 - Kiamichi Room

Track 3- Red Carpet

Track 4 - Green Country



Right: Recent earthquake activity in Oklahoma. Source: USGS

Far Right: Construction of Devon Tower, the tallest building in downtown Oklahoma City.

WEDNESDAY, APRIL 12 (continued)

Panel Discussions

Guidance and Tools for Community Resilience Planning – Implementation of the NIST Planning Guide

10:30 a.m. – 12:00 p.m., *Plaza South Ballrooom*

The National Institute of Standards and Technology's Community Resilience Group is actively pursuing the implementation of their Community Resilience Planning Guide for Buildings and Infrastructure Systems that was published in 2016. The panel will discuss the status and significant accomplishments to date. Participants will leave the session with the following takeaways: a clear understanding of the NIST Community Resilience Guide as illustrated by the experiences of the pilot communities; specific suggestions with take-home value for how to start and implement the 6-step process in any community; an understanding of where researchers and professional designers and engineers can engage in the future development of resilience guidance documents; the tools that are now available or will soon be available to assist communities in resilience planning; and an understanding of how the each attendee can assist their community in becoming resilient.

Moderator: Therese P. McAllister, Ph.D., P.E., F.SEI, M.ASCE
Panelists:
Steve Cauffman, *Research Engineer, National institute of Standards & Technology*
David Mizzen, EIT, *Staff Engineer/Scientist, Applied Research Assoc.*
Jay Raskin, *Jay Raskin Architects, National Institute of Standards & Technology's Community Resilience Panel*
John van de Lindt, Ph.D., *Colorado State University*

Recent Oklahoma Earthquakes and the Built Environment

1:30 – 3:30 p.m., *Plaza South Ballrooom*

Experts on seismology, structural engineering, and geotechnical engineering will discuss the patterns of seismicity and consequences of recent Oklahoma earthquakes. Brief presentations will be followed by questions and answers.

Moderator: Muralee Muraleetharan, *Geotechnical Engineering Professor, Kimmell-Bernard Chair in Engineering, David Ross Boyd and Presidential Professor*
Panelists:
Jeremy Boak, *Director, Oklahoma Geological Survey*
Scott Harvey, *Assistant Professor of Structural Engineering*

Networking Luncheon

12:00 – 1:30 p.m., *Century Ballroom*

KEYNOTE ADDRESS

MARS CITY: The Ultimate Resilient Facility

What do you do if your facility suffers a power failure for two weeks due to a global dust storm? What if there is contamination in your drinking water? What if your building systems need emergency spare parts and the nearest Home Depot is 48 million miles away – every two years. That's just some of the issues you have living in a community on Mars. MARS CITY, a joint project of the Total Learning Research Institute and NASA has had to be designed to answer those questions. A simulation of building maintenance requiring a robust BIM, a complete specification of MEP engineering equipment and a populated maintenance management software system has been developed in concert with the National Institute of Building Sciences. In this session, participants will engage in the type of team brainstorming required to understand resilience issues required for building cities on other planets – and the lessons for resilience in extreme environments on Earth.

Kerry M. Joels, Ph.D.

Kerry Joels has a Doctorate in Aerospace and Education from Oklahoma State University. His professional experience includes creative and leadership positions with NASA, the National Air and Space Museum as Education Division Director and Curator, the White House Young Astronaut Program as Director of Curriculum, and the Challenger Center for Space Science Education as first Director of Program Development. He was a founding Board member of Total Learning Research Institute and is the serving President directing the SPACE EXPLORERS Space Shuttle and Mars Simulator programs and the MARS CITY STEM Challenge effort. He served on the White House Space Exploration Initiative for Moon/Mars mission planning. Programs he has directed or created have impacted millions of students over the past 30 years. He has also been the chairman of the Space Educator Award of the National Space Club recognizing others for 33 years. He is the author of the Mars One Crew Manual and other books.

Welcome Reception

6:00 – 8:00 p.m., *Century Foyer*

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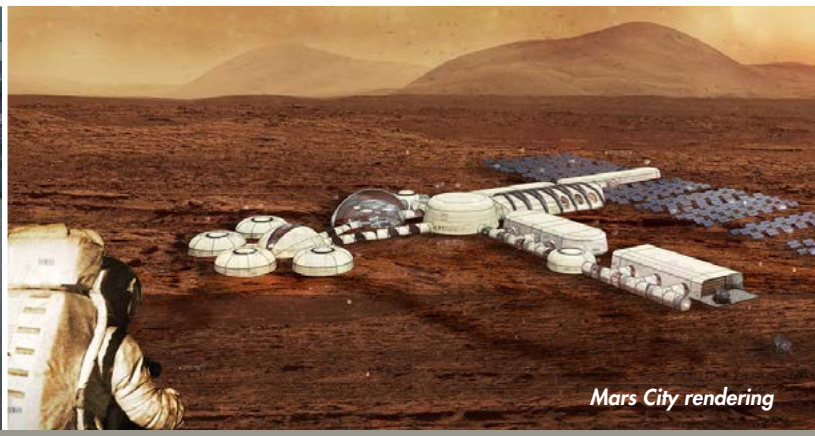


Mars City rendering

THURSDAY, APRIL 13

Registration Hours
7:00 a.m. – 6:00 p.m., *Century Foyer*

Student Competition Jury Feedback
7:00 a.m. – 9:00 a.m., *Plaza North Ballroom*

Exhibit Hours
7:30 a.m. – 3:30 p.m., *Century Foyer*

Continental Breakfast
7:30 – 8:30 a.m., *Century Foyer*

Concurrent Sessions
8:00 a.m. – 4:15 p.m.
Track 1 - Plaza South Room
Track 2 - Kiamichi Room
Track 3- Red Carpet
Track 4 - Green Country
Track 5 - Plaza North

Panel Discussion
8:00 – 9:30 a.m., *Plaza South Ballrooom*

Claims Reduction Through Understanding Failure

Panel Discussion Proposal

Architects, engineers, and other design professionals face a daunting array of professional risks. We navigate the risk landscape by carefully defining scope, performing work in a manner that is consistent of the applicable standard of care, and by effective coordination and communication. Moreover, the lifelong study of engineering failures can help design professionals be more aware of those aspects of the design process where failures have historically been most likely to originate.

This panel discussion will include brief discussions of the practice of forensic engineering and use case studies to demonstrate the integration between engineering practice and resulting claims.

Keynote Luncheon
11:30 a.m. – 1:00 p.m., *Century Ballroom*

KEYNOTE ADDRESS

Tails of Successful Architect|Engineer Collaborations"

Hans E. Butzer, Architect, AIA, AK NW, LEED AP, *Dean and A. Blaine Imel, Jr. Professor, Mabrey Presidential Professor of Architecture and Urban Design, Recipient of the American Institute of Architects Thomas Jefferson Award for Public Architecture, The University of Oklahoma College of Architecture*

The Oklahoma City Skydance Bridge is a nationally-recognized and award-winning landmark that resulted from intense collaborations between architects and engineers, among others. Project co-creator and co-manager Hans E. Butzer will share experiences from the process of designing the iconic structure. His presentation will also touch upon his reasons for assembling a design team that included three independent structural engineers and four independent architects, and how these arrived at a consensus concept.

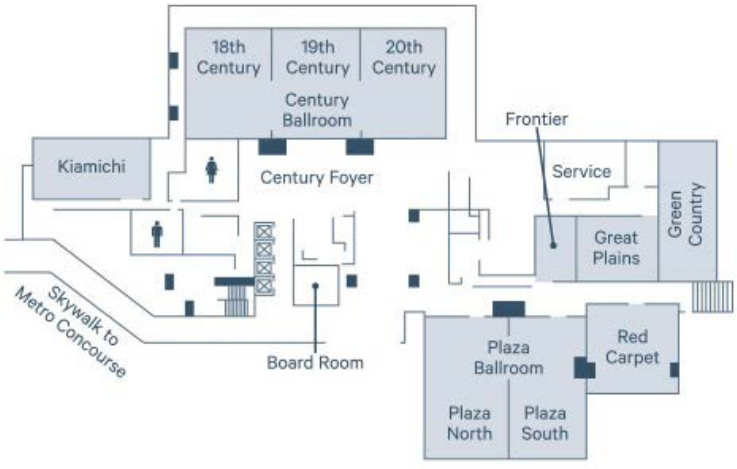
Sponsored by SOM

Professional Project Awards Presentation
4:15 – 5:15 p.m., *Century Ballroom*

Awards Banquet
6:30 – 9:00 p.m., *Century Ballroom*

Sponsored by SIMPSON GUMPERTZ & HEGER

Hotel Floor Plan



SECOND FLOOR

Wednesday, April 12

8:30 – 10:00 a.m.	**Opening Plenary,** *Century Ballroom* **Keynote Presentation:** **Designing Community Networks to Support Resilient, Sustainable Buildings in Regions of Risk** *Louise K. Comfort, Ph.D., Director, Center for Disaster Management, University of Pittsburgh*			
10:00 – 10:30 a.m.	**Networking Break,** *Century Foyer*			
10:30 a.m. – 12:00 p.m.	**Technical Sessions**			
TRACK 1, *Plaza South Ballroom*	**TRACK 2,** *Kiamichi*	**TRACK 3,** *Red Carpet*	**TRACK 4,** *Green Country*	
SESSION 1: **NIST Panel Discussion**	**SESSION 2:** **Building Electrical and Power Systems**	**SESSION 3:** **Sustainability**	**SESSION 4:** **Building Materials**	
Guidance and Tools for Community Resilience Planning – Implementation of the NIST Planning Guide **Moderator:** Therese P McAllister, Ph.D., P.E., F.SEI, M.ASCE **Panelists:** Steve Cauffman, Research Engineer, National institute of Standards & Technology David Mizzen, EIT, Staff Engineer/ Scientist, Applied Research Associates Jay Raskin, Jay Raskin Architects, National Institute of Standards & Technology's Community Resilience Panel John van de Lindt, Ph.D., Colorado State University	**Enhanced Resilience Through Building Perma-PowerLinks,** Amy Kim, Dorothy Reed **Hybrid Renewable Energy System Model Analysis: Pumped Hydrogen Storage Compared to Battery-bank Storage Systems,** Taneasha Roberts, Hongyi Cai **Photovoltaic Systems,** Diana Jones	**Investigation of Sustainability and Resilience Characteristics of Buildings Including Existing and Potential Assessment Metrics,** Vaclav Hasik, Jaskanwal P. S. Chhabra, Gordon P. Warn, Melissa M. Bilec **Investing in Sustainable Buildings to Enhance Community Resilience,** Lee Fithian, Naiyu Wang, Zahed Siddique **Multi-Criteria Design Optimization of Sustainable and Resilient Concrete,** Wil Srubar, Joseph Kasprzyk **Strength and Permeability of Fly Ash Based Concrete Reinforced with Steel Fibers,** Anup Thakur, Pankaj Pushkarna	**Accounting for Carbon Sequestration Potential of Reinforced Concrete in Whole-Building Life Cycle Assessment,** Adriana Souto-Martinez, Elizabeth Delesky, Kyle Foster, Wil V. Srubar III **Energy Performance Analysis of Alkali-Activated Cement-Based Concrete Buildings,** Juan Pablo Gevaudan, Wil Srubar **Transparency in the Built Environment,** Luke Leung, Rebecca Delaney, Stephen D Ray	**AEI BUILD** **AEI Deliver** **AEI Enclose** **AEI Learn** **AEI Modular** **AEI Perform** **AEI Resilient** **AEI Secure** **AEI Sustain**
12:00 – 1:30 p.m.	**Networking Luncheon,** *Century Ballroom*			
1:30 – 3:00 p.m.	**Technical Sessions**			
TRACK 1, *Plaza South Ballroom*	**TRACK 2,** *Kiamichi*	**TRACK 3,** *Red Carpet*	**TRACK 4,** *Green Country*	
SESSION 5: **Oklahoma Earthquake Panel Discussion**	**SESSION 6:** **Building Structural Systems**	**SESSION 7:** **Sustainability**	**SESSION 8:** **Building Materials**	
Recent Oklahoma Earthquakes and the Built Environment **Moderator:** Muralee Muraleetharan, Geotechnical Engineering Professor, Kimmell-Bernard Chair in Engineering, David Ross Boyd and Presidential Professor **Panelists:** Jeremy Boak, Director, Oklahoma Geological Survey Scott Harvey, Assistant Professor of Structural Engineering	**Structural Engineering for the Future,** Caroline Field, Luke Pascoe **A Comparison Between Static and Quasi-Dynamic Loading on Flexible Shear Connections,** Christopher Raebel, Megan Hayes **A Sustainable Approach to Assess the Resilience of Perforated Wood Shear Walls,** Elizabeth Berry, Behnam Shadravan, Fariborz Tehrani **Improving Seismic Resilience Using Structural Systems with Friction-Based Fuses,** Mark Sarkisian, Neville Mathias, Rupa Garai, Christopher Horiuchi	**A Case Study Comparison of LEED 2.2 to 4.0,** Rachel Mosier, Douglas Gransberg **Assessing Resilience of LEED Certified Facilities in Oklahoma,** Suchismita Bhattacharjee, Sandeep Langar, Brent Everett **The Learning Buildings Framework (LBF) for Quantifying Building Adaptability,** Brandon Ross **The International Database of Adaptation and Demolition (DAaD) Building Projects,** Riley Marshall, Brandon Ross	**Shape and Size Effects on the Compressive Strength of Cement Stabilized Rammed Earth,** Deb Dulal Tripura, Souvik Das **Sustainability of Compressed Earth Block Design: Comparative Analysis of Stabilized Compressed Earth Block and Traditional Wood Framed Single Family Residences,** Shideh Shadravan, Matthew D. Reyes, Daniel J. Butko, Lisa M. Holliday, Kenneth R. Hines, Juvenal Huizar **Uses of Red Mud as a Construction Material,** Mohamed Abdel-Raheem, Lizeth Gomez Santana, Miguel Pineiro Cordova, Bilkis Olazaran Martinez	
3:00 – 3:30 p.m.	**Networking Break,** *Century Foyer*			

Technical Program *(continued)*

TRACK 1, *Plaza South Ballroom*	TRACK 2, *Kiamichi*	TRACK 3, *Red Carpet*	TRACK 4, *Green Country*	
SESSION 9: **Building Codes**	**SESSION 10:** **Building Structural Systems**	**SESSION 11:** **Sustainability**	**SESSION 12:** **Building Materials**	
When Satisfying the Code Doesn't Satisfy Society, Robert Solomon **The Evolution of Wind Load Provisions Related to Ensuring Design Resiliency,** Benjamin Barben, Ryan Solnosky **Afghanistan Building Codes (ABC): Focused on Comparative Analysis and Viability of Enforcement,** Daryoosh Haziq, Kiyotaka Morisaka **Improving Community Resilience to Hurricanes Through Adherence to Building Codes and Implementation of Code-Plus Practices,** J. Michael Grayson	**Observed Seismic Demand on Columns in SCBFs,** Seyedbabak Momenzadeh, Onur Seker, Jay Shen **The Monterey Conference Center: Creatively Taking on the Future,** Mark Sarkisian, Neville Mathias, Joanna Zhang, Samantha Walker **Resurrecting History: Renovating the Strand Theater in San Francisco,** Mark Sarkisian, Neville Mathias, Jeffrey Keileh, Joanna Zhang **Historic Desmond Building – A Case Study of an Integrated Retrofit,** Mark Sarkisian, Neville Mathias, Rupa Garai, John Lyrenmann	**Nature in the Future Built Environment,** Stephen D Ray, Rebecca Delaney, Luke Leung **Unintentional Sustainability in Schools – A Case Study of a Newly Built School's Accordance with LEED Rating System,** Mahdi Afkhamiaghda, Marguerite Keesee, lisa holliday **Value Engineering Evaluation Method for Sustainable Construction,** Joel Ochieng Wao	**Reevaluating the Modified Shear Provision of CAN/CSA S806-12 for Concrete Beams Reinforced with FRP Stirrups,** Omar ElMeligy, Amr EL-Nemr, Ahmed Deifalah **Strength Properties Study on Recycled Concrete Aggregate and Natural Aggregate: Comparison of Analytical and Experimental Investigations,** Kaliappan Nandhini, Kaliappan Usha Nandhini **Utilization of Gasifier Ash as Partial Cement and Sand Replacement in Cement Mortar,** Mohamed Abdel-Raheem, Bilkis Olazaran Martinez, Karla Ruiz, Angelica Neira, Lizeth Gomez Santana **Calcium Sulfoaluminate Cement Concrete for Precast, Prestressed Concrete Components,** Troy Bowser, Royce Floyd	**AEI BUILD** **AEI Deliver** **AEI Enclose** **AEI Learn** **AEI Modular** **AEI Perform** **AEI Resilient** **AEI Secure** **AEI Sustain**
6:00 – 8:00 p.m.	**Welcome Reception,** *Century Foyer*			

Thursday, April 13

8:00 – 9:30 a.m	Technical Sessions			
TRACK 1, *Plaza South Ballroom*	**TRACK 2,** *Kiamichi*	**TRACK 3,** *Red Carpet*	**TRACK 4,** *Green Country*	**TRACK 5,** *Plaza North Ballroom*
SESSION 13: **Claims Panel Discussion**	**SESSION 14:** **Building Structural Systems**	**SESSION 15:** **Architectural Engineering Education**	**SESSION 16:** **Design & Construction Process and Management**	
Claims Reduction Through Understanding Failure Panel Discussion, **Panelists:** Michael J. Drerup, P.E., ASCE Forensics Division M. Kevin Parfitt, P.E., The Pennsylvania State University	**Modeling and Design of Multi-functional Floor Isolation Systems,** Philip Harvey Jr., Nisal Halaba Arachchige Senarathna **Floor Vibrations in Composite Floor Systems,** Breanna Bailey, Anna Leija **A Stochastic Study on Distribution Parameters of Random Individual Walking Excitations,** Zhiqiang Zhang, Bill Zhang, Jieqiang Wei, Peng Luo, Changhui Cui **Nonlinear Vibrations Based Damage Detection for Building Structural Systems,** Philip Scott Harvey Jr., Royce W. Floyd, Jin-Song Pei, Le Gruenwald, Peng F. Tang, Danh V. Doan, Joseph P. Havlicek	**Letting the Kids Pick Their Grades,** Chris Ahern **Team Teaching: A Solution to Multidisciplinary Architectural Engineering Capstone Design Requirement,** James Glusing, Breanna Bailey, Joseph Sai **Nebraska Architectural Engineering Reorganized Capstone Course,** Clarence Waters **Building Code Educational Modules for Professional Exposure in AE Curriculums,** Ryan Solnosky, Walter Schneider, Alexa Kottmeyer, Sarah Zappe	**The Role of BIM in Simplifying Construction Permits in Kuwait, Nawari NAWARI,** Adel Alsaffar **Parametric Blockwall-Assembly Algorithms for the Automated Generation of Virtual Wall Mockups using BIM,** Tarek Zaki, Khaled Nassar, Osama Hosny **Design Nuances of Federal and Private Healthcare,** Jimmy Bates, Susana Erpestad	**AEI BUILD** **AEI Deliver** **AEI Enclose** **AEI Learn** **AEI Modular** **AEI Perform** **AEI Resilient** **AEI Secure** **AEI Sustain**
9:30 – 10:00 a.m.	**Networking Break,** *Century Foyer*			

10:00 – 11:30 a.m.	Technical Sessions			
TRACK 1, *Plaza South Ballroom*	**TRACK 2,** *Kiamichi*	**TRACK 3,** *Red Carpet*	**TRACK 4,** *Green Country*	**TRACK 5,** *Plaza North Ballroom*
SESSION 17: **Building Mechanical Systems**	**SESSION18:** **Building Structural Systems**	**SESSION 19:** **Architectural Engineering Education**	**SESSION 20:** **Design and Construction Process and Management**	**SESSION 21:** **Integrated Systems**
Greenhouse Design with Waste Heat: Principles and Practices, Anthony Denzer, Liping Wang, Yara Thomas, Gabrielle McMorrow **Experimental Investigation on Energy Performance of Variable Frequency Drives in HVAC Systems,** Koosha Kiamehr, Shima Shahahmadi, Gang Wang, Li Song **Energy Savings Potential in a Medical Facility through Custom Minimum Airflow Resets,** Shima Shahahmadi **A Review and Procedure to Select Indoor Air Quality Measures for Educational Facilities,** Irfan Anees Mohammed, Pelin Gultekin-Bice **Preliminary Tests for an Engineering Approach to Achieve Energy Efficient Airside Economizers without Humidity Sensors,** Gang Wang, Li Song, Liping Wang	**Windstorm Resilience of a 46-Story Office Building, Bsrat Ghebremariam,** Johnn Judd **Effects of Balconies on the Wind Loading of a Tall Building,** Tucker Morton, Thomas Mara **Evaluation and Design of Blast-Resistant Buildings at Refineries and Petrochemical Facilities,** Paul Summers, Guzhao Li, Zonglei Mu **Blast-Resistant Design of a Three-Story Glass Curtain Wall System at a Federal Research Facility,** Guzhao Li, Paul B. Summers, Terry R. McDonnell, Ronald O. Hamburger	**A Statistical Evaluation of the Value of Pre-engineering Curricula on First-Year Civil Engineering Student Performance,** Christopher Raebel, Blake Wentz, Frank Mahuta **Faculty Learning Community (FLC) for BIM Education in Multidisciplinary School,** Asregedew Woldesenbet, Changbum Ahn, Hee-Jeong Kim, Saeed Rokooei **Updating the Curriculum in an AE Program to Include New Degree Options,** John Phillips **Integrative Design and Project-based Learning in AE Education - A Critical Review,** Lisa Iulo, Ross Weinreb, Reggie Aviles, Moses Ling	**Facilitating the Adoption of New Project Delivery Practices among Architecture, Engineering, and Construction Project Teams, Brian Lines,** Kenneth Sullvan, Anthony Perrenoud **New Association for Capital Project Professionals – Its Mission: Accelerate Professional Development and Team Innovation Across the Supply Chain,** Noe Saenz, Eric Marks, Edward Back **Increasing the Productivity of a Construction Project Using Collaborative Pull Planning,** Somik Ghosh, Matthew Reyes, Anthony Perrenoud, Malcolm Coetzee **Transform Your Design Construct Process – Crossing the Divide from CAD to Revit to BIM,** Bryce Finnerty, Bryce Finnerty	**Designing a Resilient Prism,** Mark Sarkisian, Peter Lee, Rupa Garai, Andrew Krebs **Integration of Augmented Reality, Building Information Modeling and Image Processing in Construction Management: A Content Analysis,** Ali Karji, Asregedew Woldesenbet, Saeed Rokooei **The NIST House: Applicability in the Rocky Mountain West,** Matthew Schneider, Anthony Denzer, Jon Gardzelewski **Architecturally Integrated Photovoltaic Panels: Residential Design Methods and Consumer Preferences,** Jon Gardzelewski, Anthony Denzer, Benjamin Gilbert
11:30 a.m. – 1:00 p.m.	**Keynote Luncheon,** *Century Ballroom* **Tails of Successful Architect-Engineer Collaborations** **Hans Butzer,** *Architect, AIA, AK NW, LEED AP BD+C*			
1:00 – 2:30 p.m.	Technical Sessions			
TRACK 1, *Plaza South Ballroom*	**TRACK 2,** *Kiamichi*	**TRACK 3,** *Red Carpet*	**TRACK 4,** *Green Country*	**TRACK 5,** *Plaza North Ballroom*
SESSION 22: **Building Envelope**	**SESSION 23:** **Building Structural Systems**	**SESSION 24:** **Architectural Engineering Education**	**SESSION 25:** **Design and Construction Process and Management**	**SESSION 26:** **Integrated Systems**
A Simple Table for Selecting Insulating Glass Unit Constructions, Joseph Minor **Optimization of Advanced Structural Silicone Glazing,** Charles Clift, Peter Hutley, Vicente Montes **The Petersen Museum Façade: Unique Structural Challenges,** Jeff Denton **Advances in Debris Cannon Technology,** Collin Sewell, Collin Sewell, Andrew Graettinger, Thang Dao, Ed Back, Lawrence Powell	**Moscone Center Expansion: An Integrated Structural Design Approach,** Mark Sarkisian, Neville Mathias, John Gordon, Lindsay Hu, Christopher Horiuchi **Toward a Structural Comprehension of an 18th Century Spanish Colonial Stone Masonry Monument: The Church of Mission San Jose y Miguel de Aguayo, Texas,** Angela Lombardi, Saadet Toker Beeson **Lightweight Rapidly Constructible and Reconfigurable Modular Steel Floor System: Serviceability Analysis and Design,** Brian Robertson, Eugene Baodi-Danquah, Matthew Fadden, Elaina Sutley, Joe Colistra	**Digital and Media-Based Assignments in the Structures Classroom,** M.S. Uihlein **Revisiting Form and Forces: A Critique of Graphical Statics,** Jonathan Ochshorn **Does Gamer Personality Affect the Experience and Engagement of Architectural Engineering Sophomores in Fundamental Classes?** Ece Erdogmus, Ariel Kousgaard, Erica Ryherd, Sydney Brown **The Increasing Globalization of Criminal Prosecutions in Disasters and Tragedies,** Denis Binder **Revisiting Form and Forces: A Critique of Graphical Statics,** Jonathan Ochshorn	**Collaborative Risk Management of the Approval Process of Building Envelope Materials,** Anthony Perrenoud, Matt Reyes, Somik Ghosh, Malcolm Coetzee **Best Value Procurement of Architectural and Engineering Services: Selection Characteristics and the Relative Influence of Various Evaluation Criteria,** Brian Lines, Amirali Shalwani **A Comparative Case Study Approach: Identifying the Discrepancy Between Energy Performance Results,** Himanshu Patel Tuniki, Pelin Gultekin-Bicer	**Impact of the Virtual Collaboration on Project Progress Monitoring in Construction Industry,** Sepehr Alizadehsalehi, Ibrahim Yitmen **An Investigation of School Environmental Effects on Student Achievement,** Michael Kuhlenengel, Laura Brill, Shihan Deng, Houston Lester, Jim Bovaird, Josephine Lau, Lily Wang, Clarence Waters **Laser Scanning Conversion of 1.5 Million Square Feet of a Private University Historic Facilities to Building Information Modeling (BIM) AS-Built Records for Space Management,** Ziad Salameh
2:30 – 2:45 pm	**Networking Break,** *Century Foyer*			

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2:45 – 4:15 p.m.	Technical Sessions			
TRACK 1, *Plaza South Ballroom*	**TRACK 2,** *Kiamichi*	**TRACK 3,** *Red Carpet*	**TRACK 4,** *Green Country*	**TRACK 5,** *Plaza North Ballroom*
SESSION 27: **Building Envelope**	**SESSION 28:** **Building Structural Systems**	**SESSION 29:** **Community Planning for Resilience**	**SESSION 30:** **Forensic Studies and Lessons Learned**	**SESSION 31:** **Occupant Safety**
Building Envelope Systems with Transparent Solid-Solid Phase Changing Material, Towards Resilient Zero-energy Buildings, Gert Guldentops, Steven Van Dessel **Numerical Simulation of Forced Convective Heat Transfer Coefficients on the Facade of High-rise Buildings,** Meseret Kahsay, Girma Bitsuamlak, Fitsuam Tariku **A Comparative Analysis for Three Residential Wall Insulation Systems in Hot-arid Climate Using Simulation tools and Experimental Testing,** Khaled Tarabieh, Ahmed Aboulmagd	**Inter-Story Drift Measurement With Surveillance Camera Video: An Experimental Investigation,** Philip Harvey Jr., Nisal Halaba Arachchige Senarathna **Torsional Bracing of Cold-Formed Roof Systems,** Shideh Shadravan, Shideh Shadravan, Chris Ramseyer **Reliability Analysis in Structural Fire Engineering,** Qianru Guo, Ann Jeffers, David Jacoby **Finite Element Analysis of Reinforced Concrete Beams With Temperature Differentials,** M.Mehdi Mirzazadeh, Martin Noel, Mark Green	**A Comprehensive Approach to Building & City Resilience, Caroline Field, Richard Look,** Thomas Lindsay **Sustainable Resilient Temporary Home,** Shannon McDonald, Lauren Ovca **Five Years after the April 27, 2011 Tuscaloosa Tornado: A Study in Community Resilience,** Patrick Crawford, Andrew Graettinger, Lawrence Powell, Sebastain Awondo, Ed Back, Samuel Spector **Predicting Tornado Damage and Recovery through Coarse Modeling of Physical-Socio-Economic Interactions at the Community-Level,** Hassan Masoomi, John van de Lindt, Lori Peek, Jennifer Tobin-Gurley, Kathrina Simonen	**A Decision Support System for Condition Assessment of Distressed Concrete Buildings,** Barkavi Thanuskodi **Hidden Corrosion in Existing Curtain Walls and Cladding Systems,** Gwenyth Searer, James Chiropolos, Steven Hovland, Andrew Bishop **A Tale of Two Sites: Settling for Less,** Michael Lester **Incorporating Case Studies in the Civil and Architectural Engineering Curriculum,** Norbert Delatte	**Increasing Seismic Activity in Oklahoma: Are Historic Buildings at Risk?,** Jeanne Homer, Daniel Lao Davila, Carisa Ramming **Addressing Severe Crowding in Entry to Prayer Areas at Shopping Malls in the Gulf Region,** Ahmed Mokhtar **Balancing School Safety with Healthy Learning Spaces,** Marguerite Keesee, Amanda E. Janitz, Lisa Holliday, Hans-Peter (Hepi) Wachter, Pamela Skraastad-Jurney **Tornado Width for Computer Modeling from Google Earth Data and Period of the Vortex,** Damaso Dominguez, Panneer Selvam
4:15 – 5:15 p.m.	**AEI Professional Project Awards Presentations,** *Century Ballroom*			
6:30 – 9:00 p.m.	**Awards Banquet,** *Century Ballroom*			

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Registration Benefits

Included in Your Registration Fee	Full	Daily Day 1	Daily Day 2	Student Full	Exhibitor/ Sponsor Full
Networking Lunch 4/12	✔	✔		✔	✔
Keynote Luncheon 4/13	✔		✔	✔	✔
Reception	✔	✔		✔	✔
Awards Banquet	✔		✔	✔	✔
Proceedings	✔	✔	✔		✔
Continental Breakfast 4/12	✔	✔		✔	✔
Continental Breakfast 4/13	✔		✔	✔	✔

General Information

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The Sheraton Downtown Hotel is barrier-free in compliance with the Americans with Disabilities Act (ADA). ASCE/AEI will make every reasonable effort to accommodate your needs. If you require special assistance, please contact us no later than 20 business days prior to the event. ASCE/AEI cannot ensure the availability of appropriate accommodations without prior notification.

Attendee Packets
The packet you will receive at the on-site registration desk includes your name badge, this final program, a lanyard, tickets for events you have ordered, PDH information, and general announcements.

Attire
The dress code for the Conference is business casual (i.e. slacks, casual dresses) to business attire (i.e., neckties, business suits). Meeting room temperatures will vary, so wear layered clothing to ensure your personal comfort. We also recommend attendees wear comfortable shoes. Please note that certain events may have specific details on attire and you should refer to the event for more information.

Badge Policy and Ribbons
Your Conference registration name badge is your admission to the educational sessions. Please wear your badge at all times. Tickets are required for the special events, meals, and tours. Please be sure to bring your tickets with you to each event as you will not be admitted without a ticket. Ribbons will be available at the Registration Desk. ASCE/AEI does recommend you remove your badge when leaving the hotel.

Cancellations/Refunds
Cancellations must be received by ASCE in writing. A refund will be issued, minus a $75 processing fee, if the cancellation notice is received by ASCE by March 29, 2017. No refunds will be made for cancellations received after March 29, 2017. Send cancellations to registrations@asce.org or fax to 866-902-5593.

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The Conference proceedings will be available as a thumb drive. One copy is included with each full registration. Additional copies may be purchased for $175. To pick up your copy, present the ticket you received in your registration packet to an ASCE staff member at the Registration Desk. You must claim your thumb drive by 6:00 p.m. Thursday, April 13. To purchase a copy after the Conference, call ASCE at (800) 548-ASCE (2723), or send a fax to (866) 913-6085; or order online at www.pubs.asce.org.

Conference Surveys
A survey will be e-mailed to all attendees every day and at the conclusion of the conference.
Hearing your opinions and suggestions helps plan future conferences.

Medical Emergencies
ASCE/AEI hopes that your visit to Oklahoma City and AEI Conference 2017 will be free of medical incident. However, if you become ill at The Sheraton Downtown Hotel, please contact the front desk and tell them you have a medical emergency that requires immediate attention. St. Anthony Hospital is the closest hospital downtown.
Located at 1000 N Lee Ave, Oklahoma City, OK 73102.

No Smoking Policy
ASCE/AEI supports a "No Smoking" Policy. Smoking is prohibited at The Sheraton Downtown Hotel and all venues hosting ASCE/AEI events.

Professional Development Hours (PDHs)
You may earn PDHs, which are nationally recognized units of record, by attending conference technical sessions and short courses. Please note there are differences from state to state in continuing education requirements for professional engineering licensure. ASCE follows NCEES guidelines on continuing professional competency. Get details on your state's requirements by going to **www.ncees.org/about**.
Within 30 days of the end of the Conference, the session information will be uploaded into the MyLearning system. You will receive an email from the Conference registration system with a link and detailed instructions on how to access MyLearning and to update your session attendance. By accessing the MyLeaning system for this Conference, you automatically Agree and Certify you attended the selected sessions.
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Recycle Your Badge Holder
Please help ASCE stay green by returning your badge holder at the end of the Conference in the receptacles provided by the Registration Desk.

Registration Hours

Tuesday, April 11	12:00 p.m. – 7:00 p.m.
Wednesday, April 12	7:00 a.m. – 7:00 p.m.
Thursday, April 13	7:00 a.m. – 6:00 p.m.

Release/Waiver
Photograph Release: By attending the conference, I hereby release any photographs that may be incidentally taken of me by ASCE/AEI during these events to be used for any purpose.

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www.ou.edu/coe.html

Founded in 1890, the University of Oklahoma is a public research university located in Norman, Oklahoma, 20 miles south of Oklahoma City. The undergraduate population at the Norman campus is just over 20,000, giving students a major university experience in a private college atmosphere.

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