# BUILDINGS AT RISK

## EARTHQUAKE LOSS REDUCTION SUMMIT

A PRECURSOR TO THE GREAT CALIFORNIA SHAKEOUT

2011

## THURS.OCT.13.2011 at USC

Davidson Executive Conference Center

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The Great California ShakeOut

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# WELCOME

On behalf of the Board of Directors of the Structural Engineers Association of Southern California (SEAOSC) and the Buildings At Risk Summit Steering Committee we welcome you to the first annual Buildings At Risk | Earthquake Loss Reduction Summit! The Summit is a precursor to the Great ShakeOut event that will be held on October 20th. The ShakeOut focuses on earthquake awareness and preparedness whereas the Summit's focus is on seismic risk mitigation for buildings and infrastructure.

There are several building types that are at risk and many stakeholders do not know how this risk can be mitigated. SEAOSC has partnered with several organizations in the planning of this event including the Southern California Earthquake Center (SCEC), California Emergency Management Agency (CalEMA), Federal Emergency Management Agency (FEMA), California Institute of Technology, and the Earthquake Alliance (EQA) and we heartily thank them for all their great input and participation. In addition, we are very grateful to our sponsors whose financial support was essential in making this event possible. Several of them have not only given funding for the event, but offered their time and skills as well. Please visit their exhibits and talk with them about their products and services throughout the day.

We are very grateful for all the committee members for their tireless dedication in the planning of this event. It is indeed a great pleasure to work with such dedicated, hardworking professionals who are passionate about disseminating the need for mitigating earthquake hazards. Such productive partnering between individuals, organizations, and government officials is absolutely crucial in order for us to move forward and better substantiate and communicate the need for and encourage the implementation of seismic risk mitigation solution policies for our communities. These solutions will reduce damage and enable our communities to bounce back quickly after an earthquake, and will undoubtedly result in a significant reduction in casualties and injuries.

Additionally, we'd like to extend a very warm thank you to all of our excellent speakers, moderators, and panelists as well as to our attendees for their participation. This will be a day full of great, informative presentations and panel discussions that will help us all better understand seismic risk, building vulnerability, loss mitigation solutions, and policy strategies. We ask that you participate by listening closely to the presentations and by asking questions. Please engage the speakers and one another. This is a great way to enhance our knowledge, create lasting and effective partnerships, and advance the implementation of seismic risk mitigation solutions for our communities. As importantly, we ask you to network with other attendees, who truly represent a wide cross section of the building risk mitigation world. Our hope is that we learn from one another and develop future partnerships and strategies that will greatly help our communities become resilient and sustainable. Finally, please enjoy the Summit!

**Jeff R. Ellis, S.E.**
BAR Summit Steering Committee Chair

**Janah A. Risha, S.E.**
SEAOSC President 2011-2012

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The Great California ShakeOut

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FEMA's mission is to support our citizens and first responders to ensure that as a nation we work together to build, sustain, and improve our capability to prepare for, protect against, respond to, recover from, and mitigate all hazards.

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### Saiful - Bouquet Structural Engineers

SBI helps clients build, renovate and sustain their facilities. We consider a project successful when it makes our client successful. To achieve this requires optimal balance between function, cost and performance over time. The knowledge gained from our extensive experience is used to give clients best-of-class information about building issues such as performance, durability, and life-cycle costs. We use it to provide a "bigger picture" insight for new building design, and optimum strategies for managing existing facilities.

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DCL is one of only a few fully accredited, single source, premier laboratories for all required seismic simulation testing, analysis, reporting, and certification of essential equipment. Its advanced, triaxial shake table, experienced staff and commitment to quality makes DCL a leader in the industry.

## Fyfe Company

FYFE Company, is the manufacturer of TYFO® products and FIBRWRAP® Strengthening Systems, and is an ISO 9001:2008 registered firm. The FYFE Group, which includes a global network of certified applicators, are global leaders in the use of externally bonded Fiber Reinforced Polymer (FRP) systems for the strengthening, repair and restoration of masonry, concrete, steel and wooden structures.

## Southern California Earthquake Center

The Southern California Earthquake Center (SCEC) is a community of over 600 scientists, students, and others at over 60 institutions worldwide, headquartered at the University of Southern California. SCEC is funded by the National Science Foundation and the U.S. Geological Survey to develop a comprehensive understanding of earthquakes in Southern California and elsewhere, and to communicate useful knowledge for reducing earthquake risk.

## USGS

The USGS' mission is to provide and apply relevant earthquake science information and knowledge for reducing deaths, injuries, and property damage from earthquakes through understanding of their characteristics and effects and by providing the information and knowledge needed to mitigate these losses.

# GOLD SPONSORS

## Digitexx Data Systems, Inc.

Digitexx Data Systems, Inc. has been in the business of developing structural health monitoring systems for civil structures for more than 10 years. Our most recent solution, REFLEXX Smart Systems for Buildings, provides building owners and structural engineers with a damage detection and performance evaluation reporting system that provides essential structural health data in less than 15 minutes following a triggered event such as an earthquake.

## Saunders Construction

A specialty contractor for 30+ years, Saunders Construction, Inc. performs seismic / earthquake retrofits and structural repairs for all types of buildings. We help clients and structural engineers with every stage of the construction process, including preliminary meetings to discuss the conceptual scope of the retrofit and prepare budgetary pricing, to execution of the retrofit work and a final close-out package.

## International Code Council

The International Code Council is a member-focused association dedicated to helping the building safety community and construction industry provide safe, sustainable and affordable construction through the development of codes and standards used in the design, build and compliance process. ICC Evaluation Service (ICC-ES), a subsidiary of the International Code Council, has been the industry leader in performing technical evaluations for code compliance, fostering safe and sustainable design and construction.

## CoreBrace

CoreBrace buckling-restrained braces (BRBs) are a cost effective solution to improve the seismic performance of structures. This highly ductile system has been used in hundreds of projects for earthquake risk mitigation. CoreBrace's expert staff works closely with owners, architects, engineers, fabricators and erectors to meet their design and construction requirements and is committed to providing braces to the highest level of quality

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# AGENDA

Registration and the breakfast and lunch buffet will be located in the lobby. Breakfast, all morning sessions, and lunch will be located in the Embassy Room. Turn to page 38 for the session room map.



| Time | Topic | | | |
|---|---|---|---|---|
| 7:00a - 8:00a | Registration & Breakfast | | | |
| 8:00a - 8:15a | Welcome | | | |
| 8:15a - 8:45a | Operational Earthquake Forecasting and Decision Making in a Low-Probability Environment | | | |
| 8:45a - 9:15a | Resilient & Sustainable Communities | | | |
| 9:15a -10:15a | Vulnerable Buildings & EQ Loss Mitigation Solutions & Costs Part 1 (URM, Non-Ductile Concrete Buildings) | | | |
| 10:15a -10:30a | Break / Exhibits | | | |
| 10:30a -11:30a | Vulnerable Buildings & EQ Loss Mitigation Solutions & Costs Part 2 (Soft-Story, Historic Buildings) | | | |
| 11:30a -12:30p | Impact of EQ Loss Mitigation on EQ Recovery Panel Discussion | | | |
| 12:30p - 2:15p | Lunch & Keynote Speakers/Exhibits | | | |
| 2:15p - 3:45p | **Cardinal Room**<br>**Track 1, Session A**<br>Seismic Retrofit of Weak-Story Multi-Unit Wood-Frame Structures: A Cost Effective Technique | **Alumni Room**<br>**Track 2, Session A**<br>Reducing the Risks of Nonstructural Earthquake Damage Part 1 | **Board Room**<br>**Track 3, Session A**<br>Tall Buildings Earthquake Loss Mitigation Panel | **Embassy Room**<br>**Track 4, Session A**<br>Action & Policy Panel Putting Earthquake Loss Mitigation Solutions into Practice |
| 3:45p - 4:15p | Break/Exhibits | | | |
| 4:15p - 5:45p | **Cardinal Room**<br>**Track 1, Session B**<br>Seismic Rehabilitation Training for One- and Two-Family Wood-Frame Dwellings | **Alumni Room**<br>**Track 2, Session B**<br>Reducing the Risks of Nonstructural Earthquake Damage Part 2 | **Board Room**<br>**Track 3, Session B**<br>Non-Ductile Concrete Buildings Earthquake Loss Mitigation | **Embassy Room**<br>**Track 4, Session B**<br>Action & Policy Panel The Big Policy Picture - Motivating Earthquake Loss Mitigation in Challenging Times |
| 5:50p - 6:00p | Concluding Remarks | | | |
| 6:00p - 7:00p | Building At Risk Summit Wine & Cheese Reception | | | |

# PRESENTATION DESCRIPTION & SPEAKER BIOGRAPHIES

## 8:00a - 8:15a Welcome



### Janah Risha, S.E.; President

Risha Engineering, President, Structural Engineers Association of Southern California

Mr. Risha obtained his Bachelor's degree from Texas Tech University and holds a Masters in Structural Engineering from Stanford University. After ten years of varied practice in the industry, he established Risha Engineering Group, Inc. in 1999. His firm is located in Burbank, California, in the heart of the entertainment industry and accessible to the wide variety of projects and ventures in which Janah is involved. The firm provides structural analysis and design for new building projects, seismic analysis and strengthening of existing buildings, project management, and many other related professional services. Janah specializes in large scale design and trouble-shooting the hard-to-build, highly technical projects, tackling each with the passion and skill for which he has become so well-known.

He is currently a board member of SEAOC, has participated on numerous SEAOSC committees, and is a past member of both the ASCE Standards Committee on Seismic Rehabilitation of Building Structures and the Committee on the Condition Assessment of Existing Buildings. This involvement over the years has led to Janah's election to the office of President of the Structural Engineers Association of Southern California. In this role he brings his extensive experience in mitigating seismic hazards in existing buildings and his service to the profession and to the community in spearheading this summit

### Jean-Pierre Bardet, Ph.D.; Professor/Chair

Sonny Astani Department of Civil and Environmental Engineering, Director, USC Center on Megacities

Jean-Pierre Bardet is Professor and Chair of the Sonny Astani Department of Civil and Environmental Engineering in the Viterbi School of Engineering of the University of Southern California (USC). Originally educated in France, J.P. received his PhD from the California Institute of Technology in 1984, and joined USC as faculty shortly after. J.P. has published over 125 technical publications in geo-mechanics, geo-information, geotechnical engineering and earthquake engineering. His post-earthquake reconnaissance surveys of devastating earthquakes in California, Japan, Turkey, Taiwan, China, and India have been awarded the Gilbreth lecture of the National Academy of Engineering. J.P. contributed to constructing the System Integration of the George E. Brown Jr. Network for Earthquake Engineering Simulation, one of the largest projects ever sponsored by the National Science Foundation in the field of earthquake engineering. J.P. is presently leading a major multidisciplinary research initiative on Megacities at the USC. Last year, as the Director of the USC Center on Megacities, he led a blue ribbon panel that investigated the origins of water pipeline breaks in Los Angeles.

## 8:15a-8:45a Operational Earthquake Forecasting and Decision Making in a Low-Probability Environment

Operational earthquake forecasting (OEF) is the dissemination of authoritative information about the time dependence of seismic hazards to help communities prepare for potentially destructive earthquakes. Most previous work on the public utility of OEF has anticipated that forecasts would deliver high probabilities of large earthquakes; i.e., deterministic predictions with low error rates (false alarms and failures-to-predict) would be possible. This expectation has not been realized. An alternative to deterministic prediction is probabilistic forecasting based on empirical statistical models of aftershock triggering and seismic clustering. During periods of high seismic activity, short-term earthquake forecasts can attain prospective probability gains in excess of 100 relative to long-term forecasts. The utility of such information is by no means clear, however, because even with hundredfold increases, the probabilities of large earthquakes typically remain small, rarely exceeding a few percent over forecasting intervals of days or weeks. Civil protection agencies have been understandably cautious in implementing OEF in this sort of "low-probability environment."

The need to move more quickly has been underscored by recent seismic crises, such as the 2009 L'Aquila earthquake sequence, in which an anxious public was confused by informal and inaccurate earthquake predictions. After the L'Aquila earthquake, the Italian Department of Civil Protection appointed an International Commission on Earthquake Forecasting (ICEF), which I chaired, to recommend guidelines for OEF utilization. This presentation will review these guidelines and comment on their application in the United States. I will emphasize how authoritative statements of increased risk, even when the absolute probability is low, can provide a psychological benefit to the public by filling information vacuums that lead to informal predictions and misinformation. Formal OEF procedures based on probabilistic forecasting appropriately separate hazard estimation by scientists from the decision-making role of civil protection authorities. The prosecution of seven Italian scientists on manslaughter charges stemming from their actions before the L'Aquila earthquake makes clear why this separation should be explicit in defining OEF protocols.

### Tom Jordan, Ph.D.

**University Professor and W.M. Keck Foundation Chair in Geological Sciences and Director, Southern California Earthquake Center (SCEC)**

Tom Jordan, PH.D, is the Director of the Southern California Earthquake Center and University Professor at the University of Southern California. His research is focused on system-level models of earthquake processes, earthquake forecasting, and continental dynamics. He is a member of the California Earthquake Prediction Evaluation Council, the Governing Board of the U.S. National Research Council, and the Board of Directors of the Seismological Society of America. Jordan received his Ph.D. from the California Institute of Technology in 1972. He taught at Princeton University and the Scripps Institution of Oceanography before joining the Massachusetts Institute of Technology as the Robert R. Shrock Professor in 1984. He served as the head of MIT's Department of Earth, Atmospheric and Planetary Sciences for the decade 1988-1998.

*(Tom Jordan Biography Continued)* In 2000, he moved from MIT to USC, and in 2004, he was appointed as a USC University Professor. He has been awarded the Macelwane and Lehmann Medals of the American Geophysical Union and the Woollard Award of the Geological Society of America. He is a member of the National Academy of Sciences, the American Academy of Arts and Sciences, and the American Philosophical Society.

## 8:45a-9:15a Resilient & Sustainable Communities



Healthy cities continuously grow by driving economic development while protecting their cultural heritage. Success, in part, depends on a healthy built environment that is rooted in contemporary urban planning, sustainability and disaster resilience. Design professionals need to provide a built environment that supports all of these goals. Our designs need to be efficient, economical, adaptive, sustainable, and disaster resilient. We are doing well on all fronts except for the last. We need to develop, and add to the designer's codes and standards, provisions that will provide the buildings and lifelines needed to support disaster resilience and sustainability.

Sustainable and resilient communities enforce appropriate buildings standards and have a credible disaster response plan that assures a place, the ability, and the procedures to govern the recovery after a disaster has struck. Reconstruction financing plans and standards need to be in place before the emergency. Power, water, and communication networks need to be able to begin operating again shortly after a disaster and people should be able to stay in their homes, travel to where they need to be, and resume a fairly normal living routine within weeks. The return to "new" normal needs to occur within a few years. While every building should protect its occupants from harm and be repairable, a select few buildings need to remain operational and a larger group needs to be at least usable during repair. Lifeline systems must be restored as needed to support response and reconstruction. Quickly restoring a community through repair and only a minimum amount of reconstruction adds significantly to its sustainability.

San Francisco is already moving in this direction with its Resilient SF Program. The portion related to the physical infrastructure is being developed based on the San Francisco Planning and Urban Research Association's (SPUR) recently published policy papers related to what San Francisco needs from its seismic mitigation policies. Called the Resilient City Initiative, the papers define resiliency in a deterministic manner based on what the city needs from its buildings and lifelines to support response, recovery and rebuilding post-disaster (www.spur.org). It is a set of goals that can be applied to any community facing any natural disaster and it calls for new design codes and standards for buildings and lifeline systems. At the heart of the recommendations are the need for clarity in the hazard level, the expected damage to the physical infrastructure, and the performance levels needed for rapid recovery.

While making the shift to updated performance based codes and standards requires new policies and community support, that change is not possible without solid, unified support from the science and engineering communities that support design. We need to take the time to understand these issues, join the conversation about how to achieve resiliency, build it into our research programs, convince our owners to incorporate it into their projects, and be a part of the common voice from the earthquake profession on how to proceed.

## Chris Poland, S.E., NAE

Chairman and Sr. Principal, Degenkolb Engineers

Chris Poland's structural engineering career spans over 35 years and includes a wide variety of new design work, seismic analysis and strengthening of existing buildings, structural failure analysis, and historic preservation. He currently leads Degenkolb's New Technologies Group and consults on a wide variety of the firms projects. As an internationally recognized authority on earthquake engineering, Mr. Poland routinely participates in policy-changing research projects sponsored by the NSF, USGS, NIST and FEMA. As a passionate advocate and voice for seismic safety, he actively participates in the academic, ethical and social advancement of his field and lectures often. He has served in multiple leadership roles within EERI, ASCE, SEAOC, and ATC.

Chris presides as Chair of the congressionally mandated Advisory Committee on Earthquake Hazards Reduction for the National Earthquake Hazards Reduction Program. His latest interests, involving advocacy for Resilient Cities, lead to his involvement in the SPUR Resilient City Initiative as the chair of the Seismic Hazard Mitigation Taskforce. That work lead to his Co-Chair appointment to the San Francisco Lifelines Council. He chairs the ASCE Standards Committee on Seismic Rehabilitation, led the effort needed to produce the ASCE 31 and ASCE 41 Standards, and is currently leading the update of both standards. He is a member of the Board of Directors for the San Francisco Chamber of Commerce and the San Francisco Planning and Urban Research Association. He is the 2006 recipient of the Alfred E. Alquist award from the California Earthquake Safety Foundation, and was recently elected to the National Academy of Engineering in recognition of his career long work in support of Performance Based Earthquake Engineering

## 9:15a-9:45a Vulnerable Buildings & EQ Loss Mitigation Solutions & Costs – Part 1 (URM)

### Unreinforced Masonry Buildings (URM)

This presentation will discuss the worldwide damage and life loss caused by unreinforced masonry buildings as well as the URM experience in the United States. It will continue to explore where this experience has lead to retrofit solutions, code requirements and local ordinances and SEAOSC's role in these activities. It will conclude with an overview of the current status of programs in California.



**Mel Green, S.E.,**
**President, Melvyn Green and Associates, Inc.**

Mr. Green holds registration as a structural, civil and fire protection engineer in California. He is also licensed in Oregon, Nevada, Colorado, New Mexico and Arizona. He attended the University of Arizona and earned his Bachelor of Science in Civil Engineering in 1960. Mr. Green owns his own Engineering and Architectural Restoration firm that specializes in historic and other existing buildings as well as building code development research.

Projects include earthquake damage repair and restoration of the San Gabriel Mission and buildings at UCLA. Other recent work includes the repair and restoration of San Jose Mission, strengthening of the Golden Gate Bridge, and Frank Lloyd Wright's Ennis House repair and restoration project. He was principal investigator for the development of FEMA 310 project and has participated in the development of the Incremental Seismic Rehabilitation Series, FEMA 395 through 399 and FEMA 420.

Building code consulting work includes preparation and review of buildings code provisions for existing buildings for Maryland, New York, Rhode Island, Wichita and he was a member of the drafting committee for the International Existing Building Code. He was the principal author of the Uniform Code for Building Conservation (UCBC). In addition, he is a Professor at Goucher College where he teaches materials evaluation and conservation, an instructor at the University of Arizona teaching the Timber and Masonry design course, and also teaches historic preservation and building codes for the University of Southern California. He just completed a new book titled "Building Codes and Existing and Historic Buildings" to be published by John Wiley Company and distributed by the ICC.

## Non-Ductile Concrete Buildings

Non-ductile concrete buildings represent arguably the greatest seismic life safety hazard in many urban centers world-wide because of their collapse potential. In California, these buildings were principally constructed between approximately 1900 (when elevators first enabled the construction of relatively tall buildings) and 1973 (when local building codes disallowed this type of construction). This study combines a case study inventory with laboratory testing of components, simulations of structural performance, loss estimates and policy recommendations. The case study looks at risks from the approximately 1500 potentially non-ductile concrete buildings in the City of Los Angeles. Using state of the art spatial databases and publicly available city data, we document the geographic distribution of these buildings as well as their general characteristics with respect to structural configurations and usage. Preliminary findings suggest that the majority of buildings were constructed in the 1920s and 1960s. Dominant use types are industrial/ warehouse, office, commercial, school, and residential, with smaller numbers in building types such as medical, church, theater, hotel, and parking structure. This information combined with inventories from other cities developed by the Concrete Coalition serves as a basis for ongoing collapse risk studies related to non-ductile concrete construction and as a  to guide a testing/simulation program that will ultimately lead to more accurate loss estimation tools.

### Mary C. Comerio, Professor

Chair of Architecture Department, UC Berkeley

Mary Comerio is an internationally recognized expert on disaster recovery. She joined the faculty in the Department of Architecture at U. C. Berkeley in 1978 and served as Chair of the Department from 2006-2009.  As an architect, she has designed numerous public and private facilities including market rate and affordable housing.  Her research focuses on the costs and benefits of seismic rehabilitation (particularly housing), post-disaster recovery and reconstruction, and loss modeling.  She is the author of Disaster Hits Home: New Policy for Urban Housing Recovery, (U. C. Press, 1998), and “Can Buildings be Made Earthquake Safe” (Science Vol. 312, No. 5771, April 14, 2006).

Comerio led the FEMA sponsored Disaster Resistant University Program. Her research together with the UC Berkeley campus seismic rehabilitation program was recognized by Engineering News Record as one of the ten best seismic rehabilitation projects in the United States in 2006. Comerio also led the Building Systems Research in the Pacific Earthquake Engineering Research Center, during the ten years when PEER was one of three NSF funded national earthquake centers. Comerio is currently working on a NSF Grand Challenge project focused on the mitigation of collapse risk in nonductile concrete buildings. She spent a sabbatical year (2009-10) as a Visiting Fellow at the Public Policy Institute of California and consultant to the United Nations Environment Program on post-disaster recovery efforts in China and Haiti. She recently led the PEER/ EERI reconnaissance teams to both earthquakes in New Zealand and has participated in several other teams. In May 2011, she received the Green Star Award from the United Nations for her work in post-disaster reconstruction.

## 10:30a-11:00a Vulnerable Buildings & EQ Loss Mitigation Solutions & Costs Part 2 (Soft-Story)



### Soft-Story Buildings

Soft-Story Apartment Buildings present significant life safety issues that affect many communities in Southern California. Since many of these buildings are vulnerable to collapse in a major earthquake, but their vulnerabilities have generally not been addressed; these buildings affect not only the safety of the residents, but also the resilience of the community. This presentation outlines numerous configurations of soft-story apartments that exist in our area, shows the types of damage that has been observed in past earthquakes, discusses some of the primary means of addressing the vulnerabilities presented by these buildings, and reviews the costs related to their mitigation.

**David Pomerleau, S.E.**
Project Manager, IDS Group, Inc.

Mr. Pomerleau is currently a Project Manager at IDS Group, Inc. in Irvine, California. He has been practicing engineering for 19 years and is a licensed Civil and Structural Engineer in California. His experience has primarily focused on analysis, rehabilitation, repair and retrofit of existing buildings. He is currently managing projects involving risk assessment and seismic upgrade of major projects for the federal government, State of California, County of Los Angeles, major cities, public agencies, and private owners across California.

Mr. Pomerleau has served as Chairman of the local Existing Buildings Committee of SEAOSC and as the Chairman of the Structural Engineers Association's state level committee. While working with the Existing Buildings Committee he contributed to changes to the International Existing Building Code, and helped to develop an explanatory commentary to that code in addition to reviewing and commenting on CALBO's Repair and Reconstruction model ordinance. He also coordinated local Existing Building Committee efforts to provide guidance to the City of Los Angeles for their Adaptive Reuse ordinance and Information Bulletin.

Mr. Pomerleau performed damage reconnaissance surveys and participated in reporting for EERI following the Northridge Earthquake. He also has worked with several local cities to assist in the identification and inventory of seismically hazardous building types. He has also made presentations to building owners, building officials, architects, government officials, insurance company representatives, engineers, and police and fire department representatives on the topic of risk mitigation.

## 11:00a-11:30a Vulnerable Buildings & EQ Loss Mitigation Solutions & Costs –Part 2 (Historic Buildings)

### Historic Buildings

Building owners in Southern California face a very difficult dilemma when considering their seismic risks: Do they invest only in an organized preparedness program (possibly supplemented by earthquake insurance), or do they also invest in a seemingly costly seismic retrofit in order to reduce their risks? This presentation will examine this dilemma and provide owners with more information to help clarify their seismic retrofit options. It will be explained why owners of historical buildings have even more options that can be considered than owner of ordinary buildings. The role of the structural engineer in the process will be clarified; some data will be provided that helps to explain the effectiveness of full and partial seismic retrofits, and some cost analyses will be provided for consideration. The impacts of seismic retrofit versus the impacts of replacement towards the goals of sustainability will also be presented.

**David Cocke, S.E.**
President, Structural Focus

David Cocke is the founder and President of Structural Focus in Los Angeles. He started Structural Focus in 2001 after 15 years in San Francisco with Degenkolb Engineers, and another five years running their Los Angeles office. While at Degenkolb, David worked on notable historic projects such as the EQ repairs to the SF Ferry Building, several quad buildings at Stanford and the historical Hotel del Coronado.

At Structural Focus, David has worked on historic buildings ranging from a one-room school house in San Bernadino, some historic barns at Rancho Los Alamitos, an adobe ranch house on Santa Cruz Island, Fresno's Santa Fe Depot, to the adaptive reuse of a 1930's concrete sound stage at Sony. Some significant current projects include the restoration of the Wilshire Boulevard Temple, the historic May Company Building, and the new Wallis Annenberg Center for Performing Arts in Beverly Hills, which includes the renovations of a historic Post Office building.

In addition to his work in preservation, David has served on the Board of Directors of the Structural Engineers Association of both SEAONC and SEAOSC, as well as SEAOC. He also served on the California Preservation Foundation Board for seven years, on the Board of the USC Architectural Guild for five years, and was President in 2006-07. He is now Treasurer of Pasadena Heritage and is the SEAOC appointed Alternate Member on the State Historical Building Safety Board.

## 11:30a-12:30p Impact of EQ Loss Mitigation on EQ Recovery Panel Discussion

**Moderator:** **Joe La Brie, S.E.;** President, MakeItRight, Inc.
**Panelists:** **Ken Hudnut, Ph.D;** USGS
**Swaminathan Krishnan, Ph.D., S.E.;** Assistant Professor, California Institute of Technology
**Dr. Saiful Islam, S.E.;** President, Saiful Bouquet Structural Engineers
**Adam Rose, Ph.D.;** Research Professor, USC School of Policy, Planning & Development



On August 22, 2011 an Earthquake of Magnitude 5.3 rocked southern Colorado. Only hours later, Virginia shook at a level of magnitude 5.8. While these events are not completely unexpected, they are rare in these regions and even more uncommon is that the events would happen within such a short time period of each other. Southern California does not have the luxury of low seismic risk like these regions and it is essential that the structural engineering community surround the enormous challenges associated with the levels of significant risk here at home. The panel discussion will delve into the threat to life, property, infrastructure and the potential for economic loss. It will offer insights to loss mitigation on earthquake recovery of critical lifelines at fault crossings, anticipated disruption, and plans for the lifeline repair prioritization. The discussion will capture the important lessons learned from the simulation of a wide range of earthquakes scenarios along the southern region of the San Andreas Fault and the expected structural response of the current building inventory as well as economic impacts on these areas. It will explore methods for improving building performance and a basis for identifying those buildings which are of highest priority.

**Moderator**
**Joe La Brie, S.E.**
President, MakeItRight, Inc.

Since graduating from the University of California at Davis in 1981, Mr. La Brie has been a member of the board of directors for the Structural Engineers Association of Southern California and an active member the American Society of Civil Engineers and has served on several committees. He is a registered Civil and Structural Engineer in the State of California and his work experience includes the design and engineering management of a myriad of different buildings.

In January of 2003 he established a new, multidiscipline design firm called MakeItRight, Inc. With Structural Engineering as the backbone of the firm's technical expertise and hospital design as the focus of its mission, Makeitright, Inc. offers new design value tailor made for the development of hospital facilities and the important utility systems within them. In May of 2010 he and key partners created Dynamic Certification Laboratory (DCL). Since its debut, this shake table laboratory has been used extensively for the Certification of Designated Seismic Systems.

## 11:30a-12:30p Impact of EQ Loss Mitigation on EQ Recovery Panel Discussion (Cont.)

*(Joe La Brie Biography Continued)* The primary focus of Mr. La Brie's efforts over the years has been in the development of health care facilities. In fact, on January 2005, the director of the Office of Statewide Health Planning and Development (OSHPD) appointed him a Member of the Hospital Building Safety Board (HBSB). He served as Vice Chairman of the Board in 2007 and 2008. In November of 2008 he was elected to be the HBSB Chairman for the new term through 2012.

Capital Improvements, New Buildings, Seismic Retrofit Projects, and his attention to issues related to the Seismic considerations for non-structural components make up his robust work experience. He has been vigilant to follow and stay current with the technical developments of California's Hospital Building Seismic Upgrade Program (Senate Bill 1953) and is actively coordinating the implementation of this work at several facilities.

Mr. La Brie is presently managing the design of hospital projects throughout the State of California. Under his leadership, the staff at MakeItRight, Inc. has designed new and retrofitted buildings in the Integrated Project Delivery (LEAN), design build, multiple-prime, and conventional design delivery environment. Regardless of the nature of the project and its method of delivery, his highest priorities are simplifying and streamlining the design and construction process by properly balancing innovation and creativity with safety, constructability and cost efficiency.

**Panelist**
**Ken Hudnut, Ph.D**
USGS

Kenneth W. Hudnut applies new technologies such as GPS and LiDAR to earthquake research as a geophysicist for the USGS in Pasadena, California. For significant earthquakes in Southern California, he directs USGS response operations and research. He represents the Southern California region, which has half of the Nation's earthquake risk, on the U. S. Earthquake Hazards Program Council and serves on the Board of Directors for the Southern California Earthquake Center. He chairs the steering committee of the California Integrated Seismic Network and led the GPS L1C signal design project. He received his Ph.D. from Columbia in 1989, and his A.B. (high honors) from Dartmouth in 1983. He is a Visiting Associate in Geophysics on the faculty of the California Institute of Technology.

**Panelist**
**Swaminathan Krishnan, Ph.D., S.E.**
Assistant Professor, California Institute of Technology

Swaminathan Krishnan is an Assistant Professor of Structural Engineering and Geophysics at the California Institute of Technology. His research interests are in the areas of earthquake engineering, computational mechanics, structural dynamics, structural stability, and computational seismology. His research group is striving to unify computational seismology and earthquake engineering in the form of rupture-to-rafters simulations for robust earthquake damage prediction, preparation, mitigation, and

*(Swaminathan Krishan Biography Continued)* disaster response. Krishnan has a PhD in civil engineering from the California Institute of Technology. He is a member of the American Society of Civil Engineers, the Network for Earthquake Engineering Simulation (NEES), the Earthquake Engineering Research Institute (EERI), the Consortium of Universities Research in Earthquake Engineering (CUREE), the Southern California Earthquake Center, the Seismological Society of America, and the Pacific Earthquake Engineering Research (PEER) Center. Krishnan is a licensed Structural Engineer (S.E.) and Professional Engineer (P.E. Civil) in the State of California.

**Panelist**
**Dr. Saiful Islam, S.E.**
President, Saiful Bouquet Structural Engineers

Dr. Islam is a nationally recognized and published seismic design expert. His expertise includes performance based seismic engineering, analyses and design related to earthquake/wind, and high-tech structural and damping systems. He has extensive experience in seismic and wind design of a wide spectrum of projects, including but not limited to, healthcare, institutional, public, essential facilities, and high rise buildings.

Dr. Islam led the design of many award winning projects including the one which received the Most Outstanding Design Excellence Award from the Structural Engineers Association of Southern California. He is professionally very active in the earthquake engineering community and has served on numerous task forces and local/state committees developing guidelines for seismic design of new and existing buildings

**Panelist**
**Adam Rose, Ph.D.**
Research Professor, USC School of Policy, Planning & Development

Adam Rose is Research Professor at the USC's School of Policy, Planning, and Development, as well as Coordinator for Economics at USC's DHS Center for Risk and Economic Analysis of Terrorism Events (CREATE). Previously, he served as Professor and Head of the Department of Energy and Environmental Economics at Pennsylvania State University. He received his Ph.D. in economics from Cornell University.

Professor Rose's main area of research is the economics of terrorism and natural hazards. He has done pioneering work on economic consequence analysis of disasters and on economic resilience. Dr. Rose is currently serving on a U.S. National Academy of Sciences panel on earthquake resilience, as co-PI on a National Science Foundation grant to estimate the economic impacts of risk amplification and stigma following terrorist attacks, and as co-PI on U.S. Homeland Security study to estimate the costs and benefits of security for the new World Trade Center. He recently coordinated 8 studies that arrived at a definitive estimate of 9/11, served as the lead researcher for a report to U.S. Congress on the net benefits of FEMA hazard mitigation

## 11:30a-12:30p Impact of EQ Loss Mitigation on EQ Recovery Panel Discussion (Cont.)

*(Adam Rose Biography Continued)* grants, as lead economist on the U.S. Geological Survey Southern California ShakeOut Earthquake and ARkStorm Scenario Projects, and as a co-PI on a project to develop an economic consequence analysis framework for the National Biodefense Analysis and Countermeasures Center.

Dr. Rose has been appointed to the editorial boards of the Journal of Regional Science, Resource and Energy Economics, Energy Policy, Energy Journal, Resource Policy, Pacific and Asian Journal of Energy, and Integrated Disaster Risk Management Journal. He has served as the American Economic Association Representative to the American Association for the Advancement of Science, on the Board of Directors of the American Association of Geographers Energy and Environment Specialty Group, on the Center for National Policy Resilience Forum Board, and on the Multi-Hazard Mitigation Council. He is the recipient of a Woodrow Wilson Fellowship, East-West Center Fellowship, American Planning Association's Outstanding Program Planning Honor Award, Earthquake Engineering Research Institute Special Service Recognition Award, and Applied Technology Council Outstanding Achievement Award.

## 12:30p-2:15p Lunch Keynote Speakers

### Sally Ziolkowski

**Division Director of Mitigation for FEMA Region IX**

Sally M. Ziolkowski is division director of Mitigation for FEMA Region IX, a position she has held since June 1999. She oversees a number of programs such as the National Flood Insurance Program, Map Modernization, Hazard Mitigation Assistance Grants, Planning, National Earthquake Hazards Reduction Program, Environment and Historic Preservation Program, and other mitigation activities that provide protection, prevention and partnerships before disasters strike. Sally has represented FEMA internationally in the countries of Turkey, Japan and Mexico, and briefed numerous government emergency management officials and foreign delegations at Region IX.

Before this appointment, Ms. Ziolkowski was division director of Preparedness, Training and Exercises where she headed the regional operation center during emergency responses. From 1991 to 1996, she was the Emergency Analyst, advising on the operational activities of the Office of the Regional Director, including inter-governmental affairs and public information. Prior to that, Sally had worked in the Emergency Management and National Preparedness Programs Division as a Preparedness/Civil Defense Programs manager and state liaison representative since 1987. She originally joined FEMA Region IX in 1982 supporting individual assistance programs in the Disaster Assistance Division.

Ms. Ziolkowski has served on numerous disasters, including the Oakland/Berkeley Hills Firestorm, Los Angeles Fires/Civil Disturbance, Hawaii's Hurricane Iniki, California's *(Sally Ziolkowski Biography Continued)* Northridge earthquake, Hurricane Katrina, southern California wildfires, floods and more. After the 1989 Loma Prieta earthquake, she organized and provided training to more than 500 FEMA, state of California and temporary personnel so that Disaster Application Centers could be operational within a 24-hour period. She served as Federal Coordinating Officer for FEMA in the state of Yap, Federated States of Micronesia.

A native of Wisconsin, Ms. Ziolkowski earned her Bachelor of Science degree in education from the University of Wisconsin – Stevens Point and a Master of Science degree in Educational Psychology from the University of Wisconsin – Milwaukee. She also has completed additional graduate work in adult education, and throughout her career has completed emergency management and professional development accredited courses.



## Code and Mitigation Issues from the Christchurch Earthquakes

The four earthquakes that struck the Christchurch, NZ area in 2010 through 11 tested common beliefs concerning building codes and seismic risk mitigation practices. Many of the engineering challenges faced in New Zealand will also face Southern California in a major earthquake. Lessons learned from the New Zealand experience will prove invaluable in preparing and designing for a major seismic event in California. Topics will include life safety versus operational design, usefulness of cost-effective mitigation, hazards of liquefaction, and future considerations for rebuilding.

**Jim Barnes, P.E.**
Associate Civil Engineer
Safety Assessment Program Coordinator
Technical Assistance Programs
Recovery Division
California Emergency Management Agency

Jim Barnes is an Associate Civil Engineer in the Recovery Division of the California Emergency Management Agency, or Cal EMA (formerly known as the Governor's Office of Emergency Services, or OES). He has worked for the agency for 18 years, serving in the Public Assistance, Planning, and Technical Assistance Programs Branches during that time. He is currently the lead statewide coordinator of the Safety Assessment Program. Mr. Barnes has been with the Safety Assessment Program since 2002, and has instructed over 100 Safety Assessment-related classes. He also assists with engineering-related issues pertaining to rebuilding after disasters, and with the statewide Preliminary Damage Assessment efforts. Mr. Barnes worked in construction-related design in California and Hawaii prior to starting at OES in 1993.

## ShakeOut in Christchurch

Observing the Christchurch earthquake through the lens of the southern California ShakeOut scenario reveals the similarities and differences between the two events. The ShakeOut scenario was produced by the U.S. and California Geological Surveys in 2008. Two major earthquakes and thousands of aftershocks impacted Christchurch throughout 2010-11. By the very nature of earthquakes affecting urban areas with comparable building codes and standards of living there are many similarities between the events. Notable is the prevalence of the water distribution problems in Christchurch and the disproportionate contribution of water service disruption to ShakeOut economic impacts. Christchurch offers a study ground for further examination of economic resilience assumptions used in the ShakeOut economic impact analysis. There are aspects of the Christchurch earthquakes that were not addressed in the ShakeOut scenario such as evacuation and recreational losses due to rock falls, migration, the use of social media, and fears of re-entering buildings. Yet, the ShakeOut scenario presents the additional and serious issues of fire following earthquake, low earthquake insurance penetration rates, extensive commute patterns, and concentrations of mobile home damages in southern California. There is much inspiration to derive from the Christchurch events including the response of Individuals and the student army and the resident humor. Furthermore, the Christchurch earthquakes offer lessons learned about risk communication and recovery. We conclude with the reminder that the benefits of structural mitigation extend into reducing social and economic consequences.

The collaborative and practical approach of the ShakeOut scenario builds and strengthens the governmental, public-private, and multi-disciplinary communication networks needed to respond and recover prior to a disaster when there is no time to do so in the midst of it.

**Anne Wein, Ph.D.**
USGS

Anne Wein grew up in Christchurch, New Zealand. The city has changed drastically after a series of damaging earthquakes beginning September 4, 2010. Coincidentally, she currently works for the

U.S. Geological Survey in Menlo Park, California coordinating the economic consequences for multi-hazard scenarios. In particular, she led the activities around economic impacts and resilience and community recovery for the ShakeOut scenario released in 2008. She has followed the Christchurch earthquakes with a visit in January and a return trip in March with the EERI Learning from Earthquakes team. In the Bay Area she has been involved in coordinating meetings about community recovery for Christchurch elected officials and business leaders. Anne first came to California in 1983 to study Operations Research at Stanford University. Dr. Wein obtained a PhD in Decision Sciences at the Stanford Graduate School of Business in 1988.

## 2:15 – 3:45p Seismic Retrofit of Weak-Story Multi-Unit Wood-Frame Structures: A Cost Effective Technique (Track 1, Session A)

This training will present the concepts, theory and a design example implementing the Guidelines for the seismic retrofit of weak-story wood frame buildings. The subject structures are multi-unit apartment buildings up to four stories tall with ground floor weakness. The weakness (or the "soft-story") is often due to the presence of parking or retail use that corresponds to fewer ground floor walls relative to the living units in the upper stories. The Guidelines provide a practical method for cost effective retrofit where the work is limited to the ground floor. The Guidelines utilize a new approach called the Relative Strength Method, where the retrofit is optimized to add strength, displacement capacity and reduce torsion to the ground floor without over-strengthening and transmitting damage to the upper stories. A software program (WST: Weak-Story Tool) was developed with the Guidelines to simplify the evaluation and design process. The Weak-Story Tool will be presented as part of the training.



**David Mar, S.E.**
Tipping Mar

David Mar is a principal at Tipping Mar. He graduated from UC Berkeley with a Bachelor of Science and Master of Science in Structural Engineering and has practiced for over twenty years. His work emphasizes innovation in the areas of high-performance seismic design and sustainable design. David's practice synthesizes creative engineering, rigorous analysis and research.

## 2:15 – 3:45p Reducing the Risks of Nonstructural Earthquake Damage Part 1 (Track 2, Session A)

This training describes the sources of nonstructural earthquake damage and effective methods of reducing such damage. Nonstructural damage has accounted for the majority of damage in several recent U.S. earthquakes. This training is intended to raise awareness of potential nonstructural hazards, the costly consequences of nonstructural damage, and the opportunities and responsibilities for limiting future losses. Seismic protection of nonstructural components of buildings - that is, the architectural, mechanical, electrical, and plumbing systems, as well as furniture, fixtures, equipment, and other contents – requires design professionals to have an interdisciplinary knowledge base, which will be offered by this training.

**Maryann Phipps, S.E.**
President, Estructure

Maryann Phipps has nearly 30 years of experience evaluating, designing and renovating buildings in California. As a Structural Engineer, Maryann started the company Estructure, which provides hands-on personal service to select public and private clients. Estructure addresses the risks associated with earthquake hazards with a focus on structural design for hospital renovations and infrastructure improvements. Maryann is a recognized expert in the seismic protection of nonstructural components and is the lead technical author of the latest update of FEMA 74 – Reducing the Risks of Nonstructural Earthquake Damage. She is very active in the engineering community and is a Past President and Fellow of the Structural Engineers Association of California. Maryann earned her Bachelor of Science from Cornell University and her Master of Engineering from the University of California, Berkeley.

## 2:15p – 3:45p Tall Buildings Earthquake Loss Mitigation Panel (Track 3, Session A)

**Moderator:** **Dr. Farzad Naeim, S.E.;** LATBSDC President; V.P./General Counsel, John A. Martin & Associates

**Panelists:** **Dr. Marshall Lew, G.E.;** V.P. & Sr. Principal, MACTEC Engineering & Consulting, Inc.
**John Wallace, Ph.D., P.E.;** Professor, UCLA
**Dr. Gregg Brandow, S.E.;** President, Brandow & Johnston, Inc.
**Trailer Martin, S.E.;** John A. Martin & Associates

A short introduction into the importance of earthquake loss mitigation for tall buildings, recent progress made in performance based design of tall buildings and how it can help loss mitigation efforts and setting the agenda for other speakers to follow.

**Moderator**
**Dr. Farzad Naeim, S.E.**
LATBSDC President
V.P./General Counsel, John A. Martin & Associates

Dr. Farzad Naeim is Vice President and General Counsel at John A. Martin & Associates, Inc. He is currently serving as President of the Los Angeles Tall Buildings Structural Design Council and Chair of the Governance Board of NEES. His the past President of Earthquake Engineering Research Institute. Dr. Naeim has authored three textbooks, more than 120 scientific papers and 45 software systems related to structural and earthquake engineering.

### Earthquake Ground Motions and Tall Building Mitigation

Dr. Lew will discuss the development of ground motions for evaluation and design of tall buildings. The ground motion evaluation is very critical in the analysis of buildings and must consider site conditions, type of earthquake source, and earthquake recurrence.

**Panelist**
**Dr. Marshall Lew, G.E.**
V.P. & Sr. Principal, MACTEC Engineering & Consulting, Inc.

Dr. Marshall Lew is a Senior Principal Geotechnical Engineer with AMEC E&I, Inc. in Los Angeles. He has been practicing for over 30 years and has been involved in the seismic evaluation and design of tall buildings as well as other types of structures. He has performed seismic hazard analyses and developing ground motions for design for hundreds of structures.

## The Recent Major Earthquakes and their Implications on Tall Building Mitigation in California, Prof. John Wallace, UCLA

**Panelist**
John Wallace, Ph.D., P.E.
Professor, UCLA

John Wallace is a professor of civil engineering at UCLA and Director of the NEES@UCLA Laboratory for Field Testing and Monitoring of Structural Performance. He is a member of numerous ASCE and ACI committees, including Committee 318-H, Seismic Provisions, and ACI-ASCE Committee 352, Joints and Connections.

## Mitigation of Tall Reinforced Concrete Structures

Dr. Brandow will talk about the Mitigation of Tall Reinforced Concrete Structures. The Los Angeles Tall Building Structural Design Council is in the process of developing a guideline for the evaluation and strengthening of concrete highrise buildings. This presentation will look at the intent of this document and some examples of what we have learned from past earthquakes as part of this understanding of the performance of these buildings.

**Panelist**
**Dr. Gregg Brandow, S.E.**
President, Brandow & Johnston, Inc.

Dr. Gregg E. Brandow has practiced structural engineering with B&J for 40 years, served as president for 20 years and is currently chairman of Brandow & Johnston. Dr. Brandow has both the technical expertise and practical design experience to oversee the challenging structural designs and seismic retrofit projects that the firm has built a reputation on. His 40 years of structural design experience over seeing more than 5000 building projects, earthquake damage reconnaissance around the world, the study of structural failures, and forensic study of buildings has made him an expert in structural engineering. Dr. Brandow can be seen lecturing at his engineering classes at USC, evaluating the seismic performance of a building for a client, developing a structural system for a major project, solving a construction issue for a Contractor, or testifying as an expert on a structural failure. He directs the recruitment of engineers and technical staff, as well as the development and mentoring of that staff.

## Mitigation of Tall Steel Structures

**Panelist**
**Trailer Martin, S.E.**
John A. Martin & Associates

As president of John A. Martin & Associates, Mr. Martin is in responsible charge of all structural design and production services provided by the firm. He has 26 years of experience in structural engineering design and project management. His participation and involvement in all of the firm's projects includes oversight of the structural design teams, allocation and commitment of the firm's resources, budget and scheduling, and quality review to ensure that the structural systems designed optimally meet both design and structural/seismic requirements.

## 2:15p – 3:45p Action & Policy Panel – Putting Earthquake Loss Mitigation Solutions into Practice (Track 4, Session A)

**Moderator:** **Richard McCarthy,** Executive Director; California Seismic Safety Commission

**Panelists:** **Ifa Kashefi, Ph.D., S.E.;** Deputy Superintendent of Building I, L.A. Dept. of Building and Safety

**Doc Ngheim, M.S., S.E.;** Supervising Structural Engineer, LAUSD Facilities

**Henry Huang, P.E., CBO;** Building Official for the City of Tustin Community Development Department

**Keith Porter, Ph.D., P.E.;** Associate Research Professor, University of Colorado at Boulder; Principal, SPA Risk LLC

**Panelist**
**Richard McCarthy**
Executive Director California Seismic Safety Commission

Richard McCarthy has served as the Executive Director for the California Seismic Safety Commission since 1995. The California Seismic Safety Commission was established by legislation in January 1975 to set goals and priorities for earthquake safety and advises the Governor and the State Legislature on earthquake risk reduction issues. In addition, the Commission is responsible for developing and maintaining the California Earthquake Loss Reduction Plan. This document is a comprehensive strategic plan that sets forth statewide policy and direction in pursuit of the vision for a safer California.

Prior to joining the Seismic Safety Commission, Mr. McCarthy worked as the senior engineering geologist for the California Coastal Commission from 1979 to 1990. This Commission regulates development within the California Coastal Zone. From 1975 to 1979, Mr. McCarthy was a production geologist with Getty Oil Company in Ventura, California. Between 1973 and 1975 he was a staff geologist with Fugro Inc. in Long Beach, California and participated in site identification for nuclear power plants in California, Arizona, and Puerto Rico.

Mr. McCarthy is dedicated to the reduction of earthquake risk to the people and property in the State of California. He has published numerous articles and reports and has served on many scientific committees and federal/state task forces.

**Panelist**
**Ifa Kashefi, Ph.D., S.E.**
Deputy Superintendent of Building I, L.A. Dept. of Building and Safety

Dr. Kashefi has over 30 years of structural engineering experience, extensive managerial and leadership experience in the private and public sectors. She began her career with the Los Angeles Department of Building and Safety (LADBS) in August 1985. Her strong technical and codes knowledge, coupled with her positive attitude and problem solving skills, assisted her to quickly move up the ladder in the Department.

Currently, as the Chief of the LADBS Engineering Bureau, Dr. Kashefi directs the entire Bureau's operations and technical enhancement programs including developments and implementations of the Bureau's administrative policies and procedures. She is responsible for the work and performance of the following major department-wide operations: Building, Electrical and Mechanical Plan Check and Permit Issuance, Zoning Determinations, Building Research, Mechanical and Electrical Testing Laboratories, LADBS Building and Disabled Access Commissions, and management of the Construction Services Centers located in the Metro, Van Nuys, South Los Angeles, West Los Angeles and San Pedro Offices. She directs, manages and coordinates all aspects of these operations with over 200 employees (engineers, technicians, supervisors, and clerical support).

Dr. Kashefi also held many other LADBS management positions, including Assistant Chief of Engineering Bureau, Manager of the Van Nuys District Office, Manager of the West Los Angeles District Office, and Director of the Case Management Unit.

**Panelist**
**Doc Nghiem, Ph.D, S.E.**
Supervising Structural Engineer, LAUSD Facilities

Joining the City of Los Angeles in 1984, Doc Nghiem worked in the Earthquake Division, where he took part in the enforcement of Division 88 of LABC, Earthquake Hazard Reduction in Existing (URM Bearing Wall) Buildings through the testing grounds of the Whittier Narrows earthquake. With lessons learned from the Loma Prieta Earthquake where certain known failures that occurred during the San Fernando earthquake were repeated for lack of retrofit laws, Doc participated within the SEAOSC Existing Building Committee in developing design criteria for Divisions 91 and 95, 2 LABC ordinances for the retrofit of pre-1976 tilt-up buildings and non ductile concrete and concrete frame with infill buildings.

In 1992, Doc moved to the Bureau of Engineering, Structural Division of the City and implemented the structural and non structural retrofit of the stock of pre-1976 city owned buildings that included pre-1933 URM's, pre-1976 tilt-ups and masonry with

(*Doc Nghiem Biography Continued)* flexible diaphragms, and non ductile concrete libraries, police and fire stations and office buildings, based on the City ordinances, IEBC, FEMA 310 and 376 currently ASCE 31 and 41, with funding from LA City Seismic Bond Program supplemented with FEMA Hazard Mitigation Program.

After his retirement from the City in 2006, Doc joined LAUSD. Besides supporting District wide structural needs, Doc worked on a list of seismically vulnerable pre-1976 school buildings based on DSA AB 300; prioritized the buildings by type of construction, age, occupancy and proximity to fault; assembled a long term seismic retrofit program for the District and started implementing the program for the last 2 years. Doc also worked with District Grants and Funding to apply for FEMA and State funding for the most vulnerable building types, the tilt ups and non ductile concrete frames buildings.

Doc is a SEAOSC member and was active in the SEAOSC Subcommittees, participated in field inspections after the 87 Whittier Narrows, 89 Loma Prieta, 94 Northridge earthquakes, also the 1995 Kobe earthquake, and participated in numerous training seminars on building seismic performance (or non performance) and resulting code changes organized by the City, SEAOC, Calbo, ICBO.

## Panelist
## Henry Huang, P.E., CBO
**Building Official for the City of Tustin Community Development Department**

Mr. Y. Henry Huang, PE and CBO, is the Building Official for the City of Tustin Community Development Department. He is a Registered Professional Engineer in the states of California, Texas, and Arizona, and a Certified Building Official by the International Code Council. Before joining the City of Tustin in 2005, Henry was with City of Simi Valley and County of Los Angeles. Prior to joining the public service in 1988, Henry was a consulting engineer in Texas, designing various types of buildings in California, Texas, Arizona, Florida and other states.

Henry has been an active member of SEAOSC. He served many years in the Steel, Seismology, Existing Buildings, Quality Assurance Committees and the Board. He was recognized in 2009 as an Honorary Member of SEAOSC. Henry is also actively involved in the American Society of Civil Engineers (ASCE) and the International Code Council (ICC).

During his years in California, Henry has dedicated his work to raising the safety level of structures to protect the occupants and reduce property loss. His presentation will focus on understanding the nature of earthquakes, how structures behave during earthquakes, and how occupants should prepare for earthquakes. Henry is also participated actively in the development of building codes toward that goal. He was a member of the International Building Code Structural Committee for the 2003 and 2006 IBC. He was an active member of the former Los Angeles Regional Uniform Code Program (LARUCP) till 2004 and the SAC Joint Venture.

## 2:15p – 3:45p Action & Policy Panel – Putting Earthquake Loss Mitigation Solutions into Practice (Track 4, Session A) (Cont.)

**Panelist**
**Keith Porter, Ph.D., P.E.**
Associate Research Professor at the University of Colorado
Principal, SPA Risk LLC

Keith Porter, Ph.D., P.E., is an Associate Research Professor at the University of Colorado at Boulder and Principal of the consulting company SPA Risk LLC. He received degrees in civil and structural engineering from UC Davis (BS 1987), UC Berkeley (MEng 1990), and Stanford University (PhD 2000). He specializes in seismic vulnerability and natural-hazard risk. He helped to develop the second generation of performance-based earthquake engineering (PBEE-2), a structural-engineering method to estimate seismic risk to buildings in terms dollars, deaths, and downtime. Other recent research topics include: seismic vulnerability for the Global Earthquake Model (GEM); engineering impacts for the USGS's ShakeOut, ARkStorm, and California tsunami disaster planning scenarios; demand surge for the Willis Research Network; and benefit-cost ratio of multihazard risk mitigation for the Multihazard Mitigation Council and US Congress. He has been a professional catastrophe risk modeler, structural designer, and construction engineer. More information can be found at http://spot.colorado.edu/~porterka and www.sparisk.com.



## 4:15p – 5:45p Seismic Rehabilitation Training for One- and Two-Family Wood-Frame Dwellings (Track 1, Session B)

This training promotes seismic rehabilitation of one- and two-family dwellings, in order to reduce earthquake damage losses and increase dwelling habitability following moderate to major earthquakes. This is done by introducing the trainee to the effects of earthquakes on wood-frame dwellings, identifying common seismic vulnerabilities, building code requirements, and identifying rehabilitation approaches and available guidelines.

**Kelly Cobeen, S.E.**
Associate Principal, Wiss, Janney, Elstner Associates, Inc.

Kelly Cobeen, an Associate Principal with Wiss Janney, Elstner Associates, Inc., has 26 years of experience in structural evaluation and design of a wide range of project types, sizes, and construction materials. Kelly received her bachelors and masters degrees in Civil Engineering from University of California, Berkeley, and is a registered structural engineer in California. She has a special interest in seismic performance of light-frame construction, applicable to new construction and seismic upgrade of existing buildings. Ms. Cobeen has been involved in numerous code development, research, and educational activities, including involvement in the NEHRP Recommended Provisions for Seismic Regulations for New Buildings, and development of the International Building Code and International Residential Code. Kelly is also co-author of the Design of Wood Structures text book, and a frequent lecturer on wood and seismic design.

## 4:15p – 5:45p Reducing the Risks of Nonstructural Earthquake Damage Part 2 (Track 2, Session B)

This training describes the sources of nonstructural earthquake damage and effective methods of reducing such damage. Nonstructural damage has accounted for the majority of damage in several recent U.S. earthquakes. This training is intended to raise awareness of potential nonstructural hazards, the costly consequences of nonstructural damage, and the opportunities and responsibilities for limiting future losses. Seismic protection of nonstructural components of buildings - that is, the architectural, mechanical, electrical, and plumbing systems, as well as furniture, fixtures, equipment, and other contents – requires design professionals to have an interdisciplinary knowledge base, which will be offered by this training.

**Maryann Phipps, S.E.**
President, Estructure

Maryann Phipps has nearly 30 years of experience evaluating, designing and renovating buildings in California. As a Structural Engineer, Maryann started the company Estructure, which provides hands-on personal service to select public and private clients. Estructure addresses the risks associated with earthquake hazards with a focus on structural design for hospital renovations and infrastructure improvements. Maryann is a recognized expert in the seismic protection of nonstructural components and is the lead technical author of the latest update of FEMA 74 – Reducing the Risks of Nonstructural Earthquake Damage. She is very active in the engineering community and is a Past President and Fellow of the Structural Engineers Association of California. Maryann earned her Bachelor of Science from Cornell University and her Master of Engineering from the University of California, Berkeley.

## 4:15p – 5:45p Non-Ductile Concrete Buildings Earthquake Loss Mitigation (Track 3, Session B)



Thousands of concrete buildings in California were constructed prior to modern design and detailing requirements. Poor seismic performance of nonductile concrete structures have been repeatedly made evident, as they often accounted for a significant fraction of earthquake casualties and property loss in modern earthquakes. This combination of large stock and relative fragility make nonductile concrete building perhaps the most pressing need for seismic risk mitigation in California and elsewhere. As such, it is important that engineers understand the nature of the risks and mitigation options so that limited resources can be thoughtfully directed to have maximum effect.

This presentation begins with a review of past performance of nonductile concrete buildings in order to identify and demonstrate the culprit failure mechanisms that make these structures vulnerable: loss of joint confinement, longitudinal bar buckling, failed splices, disintegration of captive or weak columns, punching shear, weak story mechanisms, etc. Recent research and testing regarding quantification of the collapse risk associated with nonductile concrete buildings will be reviewed. Finally, available technical engineering resources will be identified, and the associated assessment methods and retrofit options will be discussed.

### Brian McDonald, Ph.D, S.E.

Principal Engineer, Exponent Failure Analysis Associates

Dr. McDonald specializes in structural analysis and design, material behavior, and construction technology with focus on issues surrounding structural damage assessment and repair methods. During more than 20 years at Exponent, he has led evaluations of damaged wood frame, reinforced concrete, post-tensioned concrete and steel buildings as well as bridges, tunnels, industrial structures, power transmission lines, communication towers, cable-supported and fabric structures. Dr. McDonald has investigated structures damaged by wind, snow, explosion, fire, construction problems, design defects, decay and corrosion, as well as hundreds of structures damaged by the Loma Prieta, Northridge, San Simeon and Hawaii earthquakes. In addition to damage investigations, Dr. McDonald also provides peer review services for structural design of complex structures, including safety-critical nuclear power plant structures. Dr. McDonald's work often includes nonlinear and dynamic structural analysis; instrumentation and full-scale testing of structures; seismic risk assessment and retrofit; and material failures including fracture and plasticity analyses.

## 4:15p – 5:45p Action & Policy Panel - The Big Policy Picture - Motivating Earthquake Loss Mitigation in Challenging Times (Track 4, Session B)

**Moderator:** **Ken Worman;** State Hazard Mitigation Officer, CalEMA
**Panelists:** **Richard McCarthy,** Executive Director; California Seismic Safety Commission
**Ken Worman;** State Hazard Mitigation Officer, CalEMA
**Chris Nance;** California Earthquake Authority
**Mark Benthien;** Director for Communication, Education & Outreach, SCEC

In these current economic times, motivating local government to actively pursue disaster mitigation measures can be a challenge. Not only is there a lack of personnel, but there is also a lack of incentive. In response to this situation, California has been proactive in coordinating resources and in forging public-private partnerships in an effort to provide local jurisdictions with the tools needed to successfully receive grant funding, implement mitigation measures, and ensure disaster resilient communities throughout the state. This session will provide attendees with up-to-date information from leaders and policy makers on how today's mitigation challenges are being addressed in California and the innovative solutions that have resulted.

### Moderator and Panelist
### Ken Worman
Acting Secretary
State Hazard Mitigation Officer, CalEMA

Ken Worman is currently serving as the State Hazard Mitigation Officer (SHMO) for the California Emergency Management Agency (Cal EMA). Ken joined Cal EMA in 1995 and has worked in all aspects of emergency management, including response, recovery, preparedness and mitigation. Ken joined the Hazard Mitigation Branch in 2000 as a Program Manager, where he supervised the administration of various federal mitigation grants and activities. In his current position, he is responsible for overseeing the Hazard Mitigation Planning Division and for ensuring that Cal EMA meets the Federal Emergency Management Agency's (FEMAs) planning requirements under California's Enhanced State Hazard Mitigation Plan. In addition, Ken's staff is responsible for the review of all Local Hazard Mitigation Plans, the Dam Inundation Program and hazard identification and analysis. Ken is a long-time resident of Folsom and is a graduate of CSU Chico.

**Panelist**
**Richard McCarthy**
Executive Director
California Seismic Safety Commission

Richard McCarthy has served as the Executive Director for the California Seismic Safety Commission since 1995. The California Seismic Safety Commission was established by legislation in January 1975 to set goals and priorities for earthquake safety and advises the Governor and the State Legislature on earthquake risk reduction issues. In addition, the Commission is responsible for developing and maintaining the California Earthquake Loss Reduction Plan. This document is a comprehensive strategic plan that sets forth statewide policy and direction in pursuit of the vision for a safer California.

Prior to joining the Seismic Safety Commission, Mr. McCarthy worked as the senior engineering geologist for the California Coastal Commission from 1979 to 1990. This Commission regulates development within the California Coastal Zone. From 1975 to 1979, Mr. McCarthy was a production geologist with Getty Oil Company in Ventura, California. Between 1973 and 1975 he was a staff geologist with Fugro Inc. in Long Beach, California and participated in site identification for nuclear power plants in California, Arizona, and Puerto Rico.

Mr. McCarthy is dedicated to the reduction of earthquake risk to the people and property in the State of California. He has published numerous articles and reports and has served on many scientific committees and federal/state task forces.

**Panelist**
**Christopher Nance**
Chief Communications Officer California Earthquake Authority

Christopher Nance joined the California Earthquake Authority in 2008. He previously has served as a Deputy Secretary for the California Business, Transportation and Housing Agency, Senior Consultant for the California Legislature, and Press Advance Representative for The White House. Nance also has worked for Ogilvy Public Relations Worldwide in Sacramento, Fleishman-Hillard in Kansas City, and Hill & Knowton in Chicago. He has earned bachelor's and master's degrees in communications from Michigan State University.

## 4:15p – 5:45p Action & Policy Panel - The Big Policy Picture - Motivating Earthquake Loss Mitigation in Challenging Times (Track 4, Session B) (Cont.)

**Panelist**
**Mark Benthien**
**Director for Communication, Education & Outreach, SCEC**

Mark Benthien is Director for Communication, Education and Outreach for the Southern California Earthquake Center, headquartered at USC. Mark received a Bachelor of Science degree in Geophysics UCLA in 1995, and a Master of Public Policy degree from USC in 2003.

Mark communicates earthquake knowledge to end-users and the general public in order to increase earthquake awareness, reduce economic losses, and save lives. Many of these efforts are in coordination with members of the Earthquake Country Alliance, a private-public partnership of organizations that provide earthquake information and services, for which Mark serves as Executive Director and lead organizer of the Great California ShakeOut. Mark is also working with other many regions that are replicating the ShakeOut.

## 5:50p - 6:00p Concluding Remarks

**Janah Risha, S.E.; President**
Risha Engineering, President, Structural Engineers Association of Southern California



## 6:00p – 7:00p Buildings At Risk Summit Wine & Cheese Reception

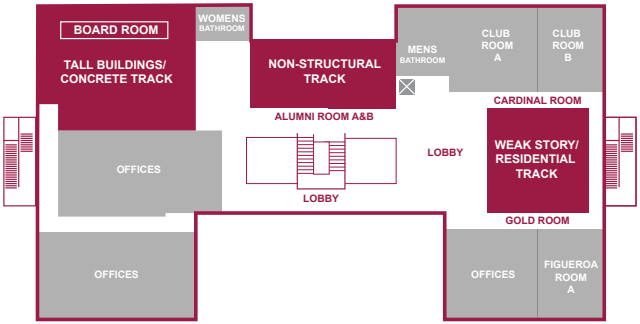
### 1994 Northridge Earthquake, Military Support to Civil Authority

While assigned as the Assistant Operations Officer, Timothy K. Penix was a seasoned 1st Lieutenant in the 2 Battalion 144th Field Artillery HQ's in Arcadia, CA when southern California experienced a magnitude 6.7 earthquake at 4:31 AM (PT) on January 17, 1994. LT Penix orders were to organize an Advance Party/Quick Response Team to survey and recon areas in Northridge and the immediate vicinity. His unit was to assist local law enforcement and fire response agencies with a primary mission to provide public safety and security as well as a secondary mission to provide urban area search and rescue. However, what they saw during their recon was devastation, panic, injuries, and the destruction of homes and buildings. LT Penix reported his findings back to his HQ's and was directed to split his advance party unit into 2 elements. They were to assist law enforcement and to assist with search and rescue. The destruction was immense. LT Penix will discuss the devastation that was encountered by his unit as a result the Northridge earthquake which caused structural damages throughout Southern California leading to in some cases loss of life and in other cases saving lives.

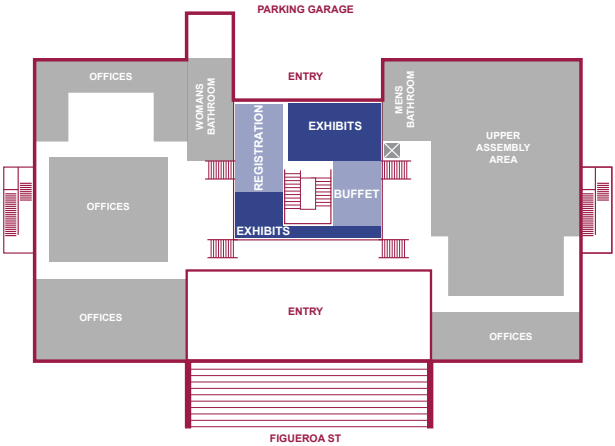
**Timothy Penix**
Captain, US Army (Retired)

Captain Timothy K. Penix retired from military service in 2003 with over 22 active years of military service in the US Marines Corps, the US Army and the California Army National Guard. His tour of duties and travels took him all over the world to places such as Japan, the Middle East and Europe as well as the U.S. He has served in any different military organizations and operations throughout the world including operations involved with Desert Shield and Desert Storm and on all matters of Administration, operations, Training and Logistics.

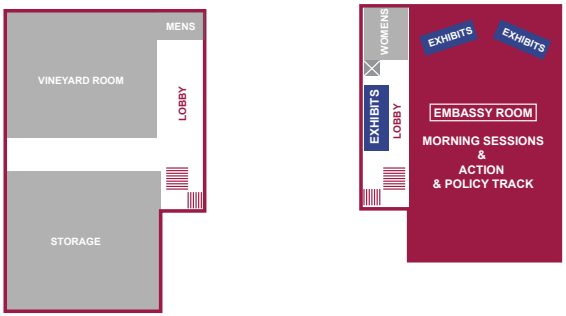
# CONFERENCE CENTER ROOM MAP




## Second Floor



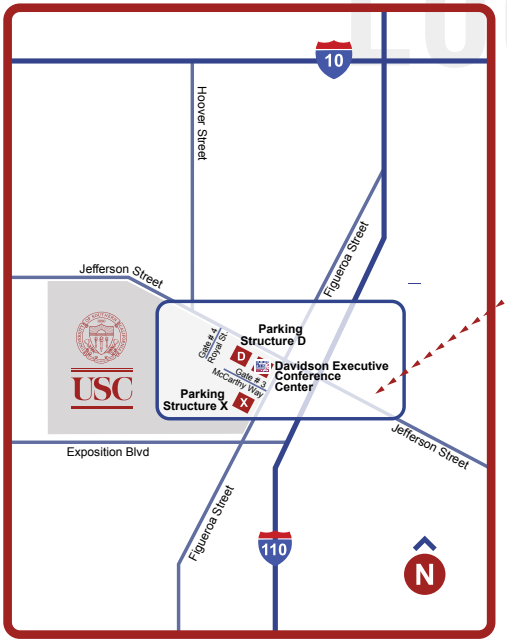

## First Floor

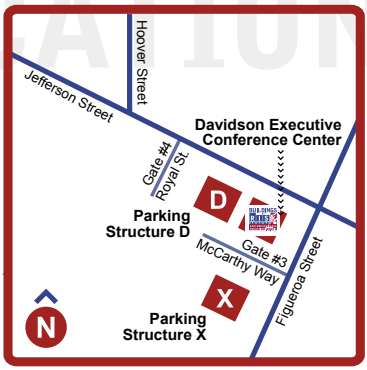



## Lower Floor

# SUMMIT LOCATION

USC Davidson Executive Conference Center 3415 S. Figueroa St., Los Angeles, CA, 90089




## Free Parking For Registered Attendees

Inform the gate parking attendant with your name a that you are attending the The Buildings At Risk Earthquake Loss Reduction Summit. The attendant will give you a complimentary parking pass and will direct you to your parking structure.

## From the 10 Fwy towards L.A. (Parking Structure D)

1. Exit the 10 freeway at Hoover Street
2. Go South on Hoover Street and follow to Jefferson
3. Turn left onto Jefferson
4. Turn right into campus at USC Royal Street (USC Gate #4)

Exit the parking structure at the south west corner to get to the Davidson Executive Conference Center

## From the 110 Fwy towards L.A. (Parking Structure D)

1. Exit the 110 freeway at Exposition Blvd.
2. Go West on Exposition Boulevard and follow the road under the freeway
3. Cross Flower Street and turn right onto Figueroa Street
4. Follow Figeroa and turn left onto Jefferson
5. Turn left into campus at USC Royal Street (USC Gate #4)

Exit the parking structure at the south west corner to get to the Davidson Executive Conference Center

## From L.A. Airport (LAX) (Parking Structure D) (USC is 13 miles from LAX)

1. Exit the Airport going south on Sepulveda Blvd.
2. Get on the 105 (Century) Freeway East
3. Take the 105 to the 110 (Harbor) Freeway North
4. Exit the 110 freeway at Exposition Boulevard
5. Go West on Exposition Boulevard and follow the road under the freeway
6. Cross Flower Street and turn right onto Figueroa Street
7. Follow Figeroa and turn left onto Jefferson
8. Turn left into campus at USC Royal Street (USC Gate #4)

Exit the parking structure at the south west corner to get to the Davidson Executive Conference Center.

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