

**Structural Engineers Association  
of California and Structural  
Engineers Association of New  
Mexico Convention**

**(SEAOC-SEANM 2012)**

**Santa Fe, New Mexico, USA  
12-15 September 2012**

**ISBN: 978-1-62748-193-9**

**Printed from e-media with permission by:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571



**Some format issues inherent in the e-media version may also appear in this print version.**

Copyright© (2012) by the Structural Engineers Association of California  
All rights reserved.

Printed by Curran Associates, Inc. (2013)

For permission requests, please contact the Structural Engineers Association of California  
at the address below.

Structural Engineers Association of California  
555 Capitol Mall, Suite 755  
Sacramento, California 95814

Phone: (916) 447-1198

Fax: (916) 442-0812

[info@seaoc.org](mailto:info@seaoc.org)

**Additional copies of this publication are available from:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: 845-758-0400  
Fax: 845-758-2634  
Email: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)



Structural Engineers Association of California
2012 SEAOC CONVENTION TECHNICAL PRESENTATIONS

Preface

The following unedited papers presented by the authors at the 2012 SEAOC Convention. These papers reflect the opinions, positions, and commentary of the authors and do not represent a consensus viewpoint of the Structural Engineers Association of California.

HOVER OVER TITLES TO JUMP TO PAPER

Table listing technical presentations with titles, authors, and page numbers. Includes titles like 'Sustainable Reconstruction of Masonry and Concrete Buildings in Haiti' and '10 Winning Tactics to Making Intelligent Choices When Purchasing Business Insurance'.

# SEAOC 2012 CONVENTION PROCEEDINGS

---



<b>Lifecycle Cost Comparisons of Different Structural Systems</b> Vesna Terzic, Sean Kai Merrifield, Stephen Mahin .....	p. 156
<b>The Future of Seismic Codes – Development of Risk-Based Design Criteria and Other New Concepts</b> Charles A. Kircher, Ph.D., P.E. ....	p. 171
<b>FEMA P-58: Next-Generation Performance-based Design Criteria</b> Ronald O. Hamburger, S.E. ....	p. 181
<b>Performance-Based Engineering of Tall Building Concrete Core Walls in High Seismicity Regions</b> Mark Sarkisian, P.E., S.E., Wael M. Hassan, Ph.D., P.E., S.E., Eric Long, P.E., S.E. ....	p. 189
<b>A Holistic Performance Based Design for an Iconic Transportation Landmark in San Francisco</b> Albert Chen, C. Kerem Gulec, Bruce Gibbons, Thornton Tomasetti, John Abruzzo .....	p. 214
<b>UC Berkeley California Memorial Stadium: Protecting and Strengthening a Landmark on an Active Fault</b> David A. Friedman, S.E., Mason T. Walters, S.E., René Vignos, S.E., Chris Petteys, S.E. ....	p. 226
<b>Providing a Stable Foundation for a Hospital to Mitigate Against Liquefaction</b> Martin B. Hudson, Ph.D., Mark A. Murphy, David L. Perry, Marshall Lew, Ph.D. ....	p. 242
<b>Heritage Structural Preservation Using a Newly Developed Textile Reinforced Mortar (TRM) System for Strengthening Historic Unreinforced Masonry Structures</b> S.F. Arnold, C. Kolyvas, T. Triantafillou .....	p. 252
<b>The Stabilization of Historic Earthen Structures: New developments in the field.</b> Edward Crocker .....	p. 264
<b>Seismic Risks of Electrical Utility Power Distribution Systems and Related Mitigation Measures</b> James J. Day, S.E., SECB .....	p. 273
<b>Seismic Rehabilitation of Los Alamos National Laboratory’s Plutonium Facility</b> Eric MacFarlane, P.E., S.E. ....	p. 286
<b>All-wood Podiums in Mid-rise Construction</b> Michelle Kam-Biron, S.E., Karyn Beebe, P.E., LEED AP .....	p. 306
<b>Parametric Study on the In-Plane Flexibility of Wood Diaphragms subjected to Lateral Loads</b> Rakesh Pathak, Ph.D. ....	p. 323
<b>Increasing Ductility of Existing Light-Frame Buildings with Gypsum Shear Walls Using a Newly Developed Fiber Reinforced Polymer (FRP) Assembly</b> Hugo C Gomez, Ph.D., Victor Reyes, P.E. ....	p. 333
<b>Enhanced Blast-Resistance of an Innovative High-Strength Steel Stud Wall System</b> Ady Aviram, Ph.D., P.E., Ronald L. Mayes, Ph.D., Ronald O. Hamburger, S.E. ....	p. 349
<b>New SEAOC Documents on the Structural Design of Rooftop Solar Arrays</b> Joe Maffei, Ph.D., S.E., LEED AP, Ron LaPlante S.E. ....	p. 361
<b>Structural Analysis and Wind Design Issues for Solar Arrays</b> Karl Telleen, S.E., David Banks, Ph.D., Rob Ward, S.E., Joe Maffei, S.E., Ph.D. ....	p. 366
<b>Seismic Considerations and Evaluation Approach for “Isolated” Rooftop PV Arrays</b> Mason Walters, S.E., Russell Berkowitz, S.E., Dennis Lau, P.E., Won Lee, Ph.D., P.E., Jack Baker, Ph.D. ....	p. 377
<b>Seismic Behavior of Unattached Solar Arrays on Flat Roofs: Analysis, Shake Table Testing, and Proposed Requirements</b> Andreas Schellenberg, Ph.D., P.E., Saeed Fathali, Ph.D., P.E., LEED AP, Joe Maffei, Ph.D., S.E., LEED AP, Kate Miller, P.E. ....	p. 390

**SEAOC 2012 CONVENTION PROCEEDINGS**

---



**Structural Optimization in Steel Moment and Braced Frame Structures for Seismic and Wind Load cases**  
Rakesh Pathak, Ph.D., Allen Adams, S.E., Seth Guthrie, S.E., Bulent Alemdar, Ph.D., P.E., Raoul Karp, S.E. .... p. 407

**Structural Design of Airport Traffic Control Towers (ATCTs) and the Cleveland Hopkins Airport ATCT**  
Gabriel J. Acero MSSE, S.E., David Kilpatrick MSc., S.E., Shafiq Alam MSc., S.E., Tom Grant, P.E. .... p. 420

**Nonlinear Modeling and Response Assessment of Tall Concrete Buildings:  
A Comparative Study of U.S. and Chinese Methodologies**  
Mark Sarkisian, S.E., Neville Mathias, S.E., Wael M. Hassan, Ph.D., S.E. .... p. 435

**Full-Scale Testing of Transbay Terminal Center Eccentrically Braced Frame Link Beams**  
C. Kerem Gulec, Bruce Gibbons, Albert Chen, Thornton Tomasetti, Hyoung-Bo Sim, Chia-Ming Uang ..... p. 455