



EARTHQUAKE ENGINEERING RESEARCH INSTITUTE NEWSLETTER

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EARTHQUAKE ENGINEERING RESEARCH INSTITUTE

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News of the Institute

2010 EERI Board Nominees Announced

The 2010 EERI Nominating Committee has submitted a slate of candidates for president-elect and the two director positions that will become open when S. K. Ghosh and Andrew Whittaker complete their terms next January. The nominees are:

For President-Elect: Thomas L. Tobin, Consultant, Tobin & Associates, Mill Valley, California.

For Director A:

- Ellen M. Rathje, Associate Professor, Department of Civil Engineering, University of Texas, Austin;
- Yumei Wang, Geohazards Team Leader, Oregon Department of Geology and Mineral Industries.

For Director B:

- Nathan C. Gould, Director, ABS Consulting, Inc., St. Louis, Missouri;
- Joseph Maffei, Principal, Rutherford & Chekene, San Francisco, California.

Additional nominations may be made by the membership in accordance with Article VII of the EERI Bylaws (Sections 4 and 5), upon submission of a petition with signatures of 25 members. Petitions must be received prior to November 1. Biographies of the candidates and short vision statements will be published in a future issue of the *Newsletter* and posted on the EERI web site, www.eeri.org.

EERI wishes to thank the Nominating Committee: Jonathan Bray (chair), Don Ballantyne, Dave Breiholz, Laurie Johnson, and Robin McGuire.

Registration Open for Seminar on NGA Models

Online registration is open at <https://www.eeri.org/registration/> for the new one-day EERI Technical Seminars on Next Generation Attenuation (NGA) Models. Participants will earn 0.7 Continuing Education Units/Professional Development Hours. The seminar (supported by FEMA) will be held September 2 in Seattle, Washington; September 3 in Oakland, California; September 10 in Salt Lake City, Utah; and September 11 in Los Angeles, California. (The locations of the 9-2 and 9-3 dates were mistakenly reversed in previous *Newsletter* calendars.) The above web page has a link to the program and speaker names, and a brochure has been mailed to EERI members.

The registration fee (including lunch and seminar notes) is \$225 for EERI members and members of co-sponsors; \$200 for Subscribing Members; \$300 for nonmembers; and \$113 for EERI student, young professional, and retired members. The registration fee goes up one week before each seminar.

The seminar is geared to both structural and geotechnical engineers interested in the implications for engineering practice of the recently developed next generation attenuation (NGA) models. Significant changes are coming to the USGS hazard maps and seismic design maps that are part of the ASCE 7 and IBC design processes. These changes need to be understood by geotechnical, seismological and structural engineers; not only will they impact site-specific studies, but they will also become a part of the 2010 ASCE 7 and 2012 IBC design provisions. This seminar will provide the

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News of the Institute

AIA-EERI Forum on Designing for EQs

On October 2, 2009, EERI Honorary Member and former President Christopher Arnold, FAIA, will moderate an all-day forum at Stanford University's Tresidder Union to inform design and construction professionals about latest seismic codes and design innovations. Organized by the Santa Clara Valley Chapter of the American Institute of Architects in partnership with EERI, this symposium follows up on the recent EERI-FEMA publication, edited and co-authored by Arnold, *Designing for Earthquakes: A Manual for Architects*, which provides architects with a current, highly illustrated,

interesting and comprehensive manual. It is an update of a 1978 AIA publication.

Many of Arnold's co-authors of *Designing for Earthquakes* will participate in the forum, along with other experts. In addition to EERI Executive Director Susan Tubbesing, other participants include EERI members Thalia Anagnos, Jonathan Bray, Mary Comerio, Richard Eisner, Ronald Hamburger, William Holmes, Maryann Phipps, Chris Poland, and Robert Reitherman. They will present innovative ways to increase building seismic performance and provide a nontechnical practical overview of seismic design, customized for architects and other design and construction professionals, managers, vendors, building officials, and development officers.

Arnold noted, "This event and the manual enable professionals who may lack engineering or seismic expertise to understand how to apply practical and low-cost construction guidelines to prevent or minimize seismic damage for a wide range of building types, both new and existing."

The cost of the forum, which qualifies for CEUs, is \$155 for AIA and EERI members; for nonmembers, \$185. A late fee will be charged after August 28. For more information and to register, visit www.aiascv.org.

Printed copies of *Designing for Earthquakes* are available at no charge from EERI (510-451-0905); for an electronic version, visit <http://www.fema.gov/library/viewRecord.do?id=2418>.

Subscribing Member News

Two New Subscribing Members

EERI is pleased to announce the following organizations recently became Bronze Subscribing Members.

Micro-g LaCoste, based in Lafayette, Colorado, is setting standards for monitoring instrumentation. The firm has been a leading manufacturer of gravity meters worldwide since 1961. Their latest gPhone meter is an ultra-sensitive low-frequency seismometer that has proven to be ideal for monitoring earthquakes or volcanic activity. It has a sophisticated data acquisition system synchronized by a rubidium clock that can be locked to GPS so that arrays of gPhones can be used to give a wider area picture of seismic or long-period gravity changes due to subsurface density changes. The instrument can be monitored and controlled through the Internet for remote operation. Micro-g LaCoste's line of products includes many other gravity meters for all applications from the airborne to borehole to defining absolute grav-

ity. For more information, visit www.microglacoste.com.

The **Puerto Rico Strong Motion Program (PRSMF)** is dedicated to obtaining the most reliable and precise strong-motion data to mitigate the number of deaths and economic losses caused by earthquakes. Directed by EERI member Jose Martinez-Cruzado since 1995, the PRSMF has grown since 1970 from seven free-field strong-motion stations and one instrumented building with analog accelerographs to 66 strong-motion stations and two instrumented buildings with digital accelerographs. The accelerographs "sleep" during weak vibrations, such as ocean waves hitting the coastline, but "wake up" during strong shaking to record it adequately.

High-intensity earthquakes have struck Puerto Rico in 1670, 1787, 1867, and 1918. Accelerograph data helps engineers by enhancing their understanding of earthquake mechanisms, describing wave attenuations and the behavior of soil deposits, and determining the characteristics of vibrations. For more information, visit <http://prsmf.uprm.edu>.

Opportunities

AIR: Seismologist

EERI Subscribing Member AIR Worldwide in Boston, Massachusetts, seeks a seismologist to join its growing multidisciplinary earthquake team in the Research & Modeling Department that is developing seismic risk analysis models used to estimate losses from natural catastrophes. For more information, visit <http://www.air-worldwide.com/Careers.aspx?o=200#> and click "All job openings in Boston."

Singapore Faculty

The School of Civil and Environmental Engineering at Nanyang Technological University (NTU) in Singapore invites applications for tenure-track positions in earthquake engineering. Required: a PhD in structural engineering or a related field, a record of research and teaching, and the ability to attract funding.

For more information, visit http://www.ntu.edu.sg/ohr/Career/CurrentOpenings/FacultyOpenings/Pages/CEE_SM.aspx.

News of the Institute

Confined Masonry Workshop in Peru

Confined masonry uses existing technologies in new, innovative ways. Correctly built, confined masonry buildings perform very well in earthquakes. In an effort to promote this technology more widely, a group of international volunteers has formed the Confined Masonry Network. This project is an outgrowth of EERI and IAEE's World Housing Encyclopedia (WHE) and is currently being supported by Risk Management Solutions. As part of the project, a five-day workshop was held in July at the Pontificia Universidad Catolica del Peru in Lima. The workshop was organized around two working groups — one developing a global design guideline and one developing an outline for a template for a global construction guideline. The design guideline group is co-chaired by Roberto Meli and Svetlana Brzev, the construction guideline group by Marcial Blondet and Tom Schacher. Both groups expect to have draft material ready for review by Sep-

tember, after which the WHE will work with various international groups to disseminate the guidelines widely and to promote their use.

Confined masonry offers improved seismic performance in low-rise, non-engineered construction. It uses the same basic materials of concrete and brick that are found in unreinforced masonry construction and in reinforced concrete frame construction with masonry infills, but with a different construction sequence and system. In confined masonry construction, the masonry walls carry the seismic loads and the concrete is used to confine the walls. This is in contrast to RC frame buildings with infills, where the concrete frames carry the load. Those buildings are more complex to design and build, and often perform poorly in earthquakes. Well-constructed confined masonry buildings have been observed to incur little or no damage, even in severe shaking.

For more information about the project, visit www.confinedmasonry.org or contact Marjorie Greene at EERI: mjgreene@eeri.org.

Confined Masonry Mini-Seminar

A Mini-Seminar on Confined Masonry Construction will be held 6-8 p.m. September 17, 2009, in the office of Arup, 560 Mission Street, 7th Floor, San Francisco, CA 94105. Co-sponsored by EERI and the Structural Engineers Association of Northern California, the presentation will include an overview of confined masonry construction, an introduction to the Confined Masonry Network, and a presentation of the work performed by Build Change as part of the earthquake reconstruction efforts in China and Indonesia (see page 4 of the June *EERI Newsletter*).

A member of the Confined Masonry Network, Build Change is an award-winning nongovernmental organization established in 2004 with a mission to reduce deaths, injuries, and economic losses in developing countries by training builders, homeowners, engineers, and government officials to use confined masonry construction.

Mini-seminar speakers are Tim Hart, a senior associate with EERI Subscribing Member Forell Elsesser Engineers of San Francisco, and EERI member Elizabeth Hausler, the Executive Director of Build Change.

SEAONC requests reservations in advance by emailing office@seaonc.org. The \$25 fee to attend the mini-seminar is payable at the door.



Participants at the Confined Masonry Workshop in Peru.

Publication

NEHRP Tech Brief #2

The National Institute of Standards and Technology (NIST) has released NEHRP Seismic Design Technical Brief No.2, *Seismic Design of Steel Special Moment Frames: A Guide for Practicing Engineers*, NIST GCR 09-917-3. Contributors include

EERI members Ronald Hamburger, Helmut Krawinkler, James Malley, Douglas Foutch, Roberto Leon, and Thomas A. Sabol. The document was developed for the NEHRP Consultants Joint Venture, which is a partnership of the Applied Technology Council and the Consortium of Universities for Research in Earthquake Engineering. The brief can be

downloaded from <http://nehrp.gov/pdf/nistgcr9-917-3.pdf> and www.nehrp-consultants.org. In the future, NIST intends to produce one to three technical briefs per year that primarily address topics of interest to earthquake professionals in design and construction. For more information, contact Jack Hayes at jack.hayes@nist.gov.

Obituary

Thomas Paulay, 1923-2009

Edited from an obituary by Athol Carr

On June 26, New Zealand lost one of its most eminent structural engineers. During his 28 years with the Department of Civil Engineering at the University of Canterbury in Christchurch, EERI member Tom Pauley had a profound influence on the seismic design of structures.

A native of Sopron, Hungary, Tom was wounded in action while serving in the Royal Hungarian Army during World War II, which left him partially deaf. After the war, he joined 300 students in the first year of civil engineering at the Technical University of Budapest, where classes were held in bombed-out ruins. In 1948, after the Soviet Union imposed total control over Hungary, Tom was one of the few students to escape. The lack of financial resources soon terminated his studies. He spent three years in Germany as a stateless refugee working with a charitable organization.

In 1951 Tom was granted a scholarship by a group of Catholic students at Victoria University in Wellington, New Zealand. He studied at the University of Canterbury under the guidance of Professor Harry Hopkins. After working for eight years for Don Bruce-Smith Consulting Engineers, he returned in 1961 to the Department of Civil Engineering as a lec-

turer in structural design. His three-hour afternoon classes were usually at least an hour longer than scheduled and sometimes rolled over to Saturdays. Decades later, the design afternoons are still remembered as "the Tom Paulay afternoons." Tom is remembered for his enthusiasm, his practical knowledge of structural design, his interest in the welfare of the students, and the injection of recent research findings and ideas. This had a major influence on design practice in New Zealand.

In 1969 Tom completed his PhD on the coupling of shear walls, under Hopkins' supervision. His concept of diagonally reinforced coupling beams has become a standard solution for obtaining a good ductile structure.

He became interested in the concepts of capacity design and used the analogy of a chain, where the design chose the selected weak ductile link (usually the beams in multi-story frames), and all other links (columns, joints and foundations) would be sufficiently strong that only the chosen members would yield. In a way, the designer would *tell the building how to deform*. This concept of the weak beam, strong column, became the design norm for buildings in New Zealand and many other earthquake-prone countries. His 1975 book with Professor Bob Park, *Reinforced Concrete Structures*, became the seminal work on capacity design. His work on

structural walls resulted in the book *Design of Reinforced Concrete and Masonry Buildings* in 1992 with Professor Nigel Priestley.

Tom became an Emeritus Professor in 1989. He served terms

as president of both the New Zealand Society of Earthquake Engineers and the International Association for Earthquake Engineering.

Among many awards and honors, he received an Order of the British Empire and honorary doctorates from the Swiss Federal Institute of Technology, the Technical University of Budapest, the Technical University of Bucharest, and the National University of Cuyo, Argentina. Tom was named one of the Legends in Earthquake Engineering at the 14th World Conference on Earthquake Engineering in Beijing in 2008.

He was the EERI Distinguished Lecturer in 1997 and was the subject of one of EERI's oral histories, published together with the oral history of his colleague Bob Park. It is viewable as a PDF at <http://www.eeri.org/site/publications-etc/oral-history>; a printed version can be purchased from EERI's online store.



Thomas Paulay

NGA Models Seminar

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background for the NGA models and how they impact the new USGS hazard maps. It will summarize major changes to seismic design maps and offer examples of applications of the new NGA models. Information about the interactive software tool, the Design Ground Motion Library Package, will also be featured. Two panel discussions will provide op-

portunities for speakers and attendees to interact on important developments.

The new NGA models were developed by the Pacific Earthquake Engineering Research (PEER) Center over a five-year period to update the ground motion predictive equations for shallow crustal earthquakes in the western United States and similar active tectonic regions. The expansion of the strong-motion database for large earthquakes at near-

field distances provided an opportunity to significantly improve previous ground motion models. The use of these models has resulted in significant decreases in the hazards maps in the longer period (1.0 secs and above) spectral values.

The seminar venues will be the Hyatt Regency Bellevue (near Seattle), the Marriott Oakland City Center, the Hilton Salt Lake City Center, and the Marriott Los Angeles Airport.



- PLEASE POST -

EERI ANNUAL STUDENT PAPER COMPETITION

The Earthquake Engineering Research Institute is pleased to announce its Annual Student Paper Competition. The purpose of the competition is to promote active involvement of students in earthquake engineering and the earthquake hazards research community.

The general rules of the contest are as follows:

Undergraduate Category

1. The paper must be directly related to earthquake engineering or earthquake hazard reduction.
2. The paper is not to exceed 12 pages in length inclusive of all tables and figures.
3. The paper must be authored by the student alone. In addition, a faculty member or other advisor is required to oversee the preparation of the manuscript. The advisor can provide feedback before submission of the paper but may not co-author the paper. The advisor's name should be included in the "Acknowledgments" section of the paper.

Graduate Category

1. The paper must be an original contribution in a discipline directly related to earthquake engineering or earthquake hazard reduction.
2. The paper is not to exceed 12 pages in length inclusive of all tables and figures.
3. The paper must represent the original work of the student and be authored by the student alone. A faculty member or other advisor may not co-author the paper.

Guidelines for preparing the manuscript can be obtained from the EERI web site (<http://www.eeri.org/site/paper-comp#details>) or from: EERI, 499 14th Street, Suite 320, Oakland, CA 94612, phone 510/451-0905, fax 510/451-5411. All papers must be e-mailed by November 2, 2009, to Juliane Lane at the EERI office at juliane@eeri.org.

Up to four student authors will be invited to EERI's Annual Meeting, February 3-6, 2010, in San Francisco, California, and will receive travel support for this purpose. Their papers will also be considered for publication in *Earthquake Spectra*. The top paper in the graduate category may be presented at the Annual Meeting.

**** DEADLINE: November 2, 2009 ****

News of the Membership

Cornell NEES Team Recognized for EOT

The Sciencenter in Ithaca, New York, affiliated with Cornell University, and Rensselaer Polytechnic Institute (RPI) have been honored as the "Most Effective Education, Outreach, and Training Activity of the Year" by NEESinc on behalf of the NSF-sponsored Network for Earthquake Engineering Simulation. Cornell's NEES research team created a unique set of five award-winning videos and a permanent science museum exhibition called *What Happens When the Earth Shakes?*

Reaching 100,000 people per year, the innovative, engaging 300-ft² interactive exhibit shows how engineers at NEES sites study earthquake effects with networked experimental facilities. With a simple hands-on shaketable, K-6 children learn the basics of dynamic response and structural reinforcement. The five 90-second videos feature earthquake footage, engineers, and experiments, and describe how research makes the built world safer. The videos can be viewed on the Cornell NEES website at <http://projects.nees.cornell.edu> and at the Sciencenter web site www.sciencenter.org/earthquake, where there

are links for additional information for teachers, adults and children.

The signature exhibit is a computer-controlled shake table, where museum visitors choose an earthquake, epicentral distance, and soil type, and then watch how a model building performs during the actual shaking. This activity will soon be on the Sciencenter's website to provide a shared public collaborative experience, similar to the capability engineering researchers have via NEES. Visitors interact for a remarkably long time with the exhibits, frequently watch all five videos, and have in-depth conversations that demonstrate they have gained significant new understanding about earthquakes and engineering.

The unique web-based participation of users off-site broadens the range of outreach and demonstrates the capabilities of a collaborative approach. The exhibit and videos provide a linkage between NEES and the network of over 400 science museums in the United States.

The principal investigator for the NEES project that developed the exhibit is Tom O'Rourke (Cornell), and the co-PIs are Kathy Krafft (Sciencenter), Harry Stewart (Cornell), and Mike O'Rourke and Mike Symans (RPI). Mike Palmer (Cornell) was the Project Manager.



Visitors at the Sciencenter in Ithaca view a video (above) and interact with the shaketable exhibit.

Next Generation Program News

The third iteration of a successful interdisciplinary engagement and training program for new scholars in the disaster research field has been launched. "Enabling the Next Generation of Hazards and Disaster Researchers" is an intensive one-year program, led by EERI member Tom Birkland of North Carolina State University, designed to introduce junior faculty to the field.

The previous two iterations of this project were led by Dennis Wenger

in the 1990s and Raymond Burby in the early 2000s. Most of the enabling fellows from the first two rounds have continued productive careers in their disciplines and in hazards studies; many are assuming leadership roles in their disciplines and in the research field, and several of the mentors in this year's program are former fellows.

Seventeen fellows were selected from over 60 applicants (see page 10 of the October 2008 *Newsletter* for the call for applications). The fellows represent a broad set of experience and interest in engineering, social sciences, and the natural

and physical sciences. The fellows met as a group for the first time for a workshop in July in Broomfield, Colorado, just prior to the annual Natural Hazards Conference in Colorado. Another workshop will be held June 2010 in Washington, D.C. Upon completion of the program, fellows will have written scholarly articles, book proposals, and/or grant proposals.

The project's website (<http://www.ncsu.edu/project/nextgen/>) includes bios of current fellows and faculty mentors as well as links to previous fellows and mentors.

News of the Profession

NEESWood Test

On July 14, 2009, in the largest shake table test the world has seen, a seven-story building (six stories of condominiums) shook with the earthquake motions of the 1994 Northridge quake, but 1.5 times as intense — more powerful than any quake California has experienced in modern times, a level that equates to an event that occurs, on average, once every 2,500 years. The altered amplitude of the 6.7 magnitude tremor violently shook furniture inside the mock apartments, but the timber structure remained intact.

Working with the Japanese government's National Research Institute for Earth Science and Disaster Prevention (NIED), as part of a broader partnership with NSF, scientists from Colorado State University and the construction company Simpson Strong-Tie tested their structure on Japan's earthquake defense shake table, the largest of its kind in the world, located in the city of Miki, north of Kobe.

The final experiment of NSF's multi-year NEESWood project, part of the Network for Earthquake Engineering Simulation, the effort tested new ways to construct woodframe buildings. "We're trying to demonstrate

that if you use performance-based design, this building will perform very well in a very large earthquake," said EERI member John van de Lindt, associate professor at CSU and principal investigator of the NEESWood Project, who predicts that more designs of wood buildings will be used in the coming years. The team will spend months analyzing the data, such as the roof relative displacement, to see how much structural damage was caused by the shaking and the likelihood of a person in the building being injured or killed.

The seven-story building constructed for the test contains 1,400 square feet of living space in 23 units and uses a new design that stacks six residential stories made of wood on top of a reinforced first story made of steel and intended for commercial shops. Most buildings this tall are built of concrete or steel. The goal of the experiment was to challenge building regulations that currently prohibit light-frame wood structures of seven stories or more in quake-prone regions of the United States.

Woodframe construction can be more affordable for mid-

rise buildings than other methods, but little is known about how such buildings respond to earthquakes. NEESWood set out in 2005 to (1) study how woodframe structures built to current specifications respond to the shaking of earthquakes, and (2) use resulting data to develop models engineers could use to design safer buildings.

The test was webcast live at www.science360.gov/live and attracted widespread major media attention. For more information, visit <http://www.nsf.gov/neeswood>.



Seven-story building tested in Japan (photo: John van de Lindt).

Oregon Seismic Rehab Grants

In 2009, Oregon will establish a new seismic rehabilitation grant program, which will provide state bond funds to help strengthen public school buildings prone to major structural damage. This program has been created to eliminate collapse-prone, high-occupancy school buildings and to increase community preparedness. The program will be administered by Oregon Emergency Management. Grant applications can be accessed at <http://www.oregon.gov/OMD/OEM/>.

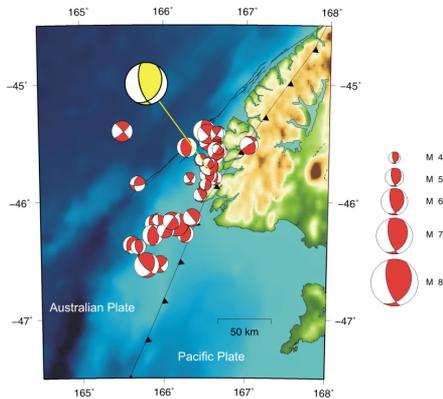
The Pacific Northwest's extreme disaster is a magnitude 9 earthquake on the Cascadia subduction zone, which would produce minutes of strong ground shaking, coastal subsidence, landslides, liquefaction, lateral spreads, and a near-field tsunami. Since 2001, state laws have required public schools to meet seismic life safety with a deadline of 2032. Due to the lack of seismic engineering and construction of most older school buildings, over 1,000 school buildings are at high risk. Seismic survey results for specific schools are provided on <http://www.oregongeology.org/sub/>

projects/rvs/default.htm and <http://www.ode.state.or.us/search/page/?id=2061>.

Under the leadership of Senate President Peter Courtney, the Oregon Legislature provided \$15 million bond funds for public schools, \$15 million bond funds for emergency facilities, and three staffers for the new seismic rehabilitation grant program. In addition, the Legislature provided \$31 million for seismic mitigation for university buildings and \$3 million for seismic upgrades for community college buildings.

Learning from Earthquakes M7.8 New Zealand Quake of July 16, 2009

Andrew King, Section Manager of New Zealand's GNS Science, provided the following information.



Focal mechanisms for the main shock and aftershocks.

The largest earthquake in the world so far this year struck a remote area of New Zealand on July 16, 2009. The epicenter of the M7.8 event was located in Dusky Sound at the southwest corner of the South Island, the Fiordland region. The mainshock was a large reverse faulting or thrust mechanism resulting from the Australian plate subducting beneath the Pacific plate upon which Fiordland lies. The aftershocks are concentrated at either end of the faulting area and are mainly a mixture of reverse faulting and strike-slip faulting mechanisms reflecting the complexity of the tectonics in the area.

The earthquake rupture started at about 30 km depth and propagated upwards and to the south, focusing energy offshore. The motion was more like a lurch than a snap (meaning the energy was released more slowly); this is typical for a deep subduction thrust event. This explains the low number of landslides and why the damage was less than expected for this size earthquake. The motion was slower (with lower frequency shaking) and "rolling"

Yaoan (Yunnan Province, China) Ms6.0 Earthquake of July 9, 2009

Junwu Dai of the Institute of Engineering Mechanics in the China Earthquake Administration provided the following information.

An Ms6.0 earthquake struck Guantun of Yaoan County in the Yunnan Province of China at 19:19 p.m. July 9, 2009. The epicenter was located at latitude N25°36', longitude E101°06', with maximum damage intensity VIII. One person was killed and 31 severely wounded. The earthquake caused about 2.15 billion Chinese yuan in direct economic losses, including damage to local buildings and lifeline systems as well as other structures in seven counties (Yaoan, Dayao, Nanhua, Mouding, Yongren, Xiangyun and Binchuan). The total damaged area is about 6,958 square km, with 230 square km of intensity VIII, 883 square km of intensity VII, and 5,845 square km of intensity VI.

Building damage: In the damage intensity VIII area, adobe/wood structures are the principal building type. Severe damage or collapse occurred to 42% of them, 48% were lightly damaged, and 10% undamaged. A small quantity of brick buildings collapsed; most were lightly damaged or undamaged. In the intensity VII area, few adobe/wood and brick/wood buildings collapsed or were seriously damaged. In the intensity VI area, most buildings remained intact except for a few seriously damaged very old adobe or brick houses.

Lifeline damage: Impacts to transportation systems included roadbed collapse, road subsidence, road surface cracks, slope collapse, culvert cracks, and bridge damage. Impacts to the power supply system included transmission pole collapse, lines broken, and damage to transformers and meters. Damage occurred to network and telecommunication facilities and broadcasting facilities. The water supply and wastewater systems sustained cracked pipelines, and reaction tank walls and joint leakage. Impacts to the hydraulic system included individual dam deformation, dam shoulder and foot leakage, anchor gate deformation, culvert leakage, irrigation canal cracks, and operation panel damage.



Damage to adobe buildings in Yaoan earthquake.

rather than the sharp movements (higher frequency shaking) that cause building damage.

For more information, visit the

Geonet site at <http://www.geonet.org.nz/news/article-jul-16-2009-fiordland-quake-biggest-for-80-years.html>.

Learning from Earthquakes

International Comparison of Assessment Procedures after Abruzzo Earthquake

EERI's Learning from Earthquakes Program recommended two members of the Structural Engineers Association of California's (SEAO's) Earthquake Performance Evaluation Program (EPEP) to participate in an international post-earthquake safety and damage assessment exercise in Italy. Anthony Court and Fred Turner of SEAO's EPEP joined representatives of Italy, Spain, Slovenia, Macedonia, Romania, Greece, Turkey, Germany, Portugal and Japan to participate in post-earthquake assessments in the red zone of downtown L'Aquila after the Abruzzo earthquake of April 6, 2009 (see the report in the June *EERI Newsletter*). Sponsored by the European Union (EU) and the Italian Civil Protection Department, the exercise involved application and comparison of different national procedures for post-earthquake safety assessment.

The EU's Strategy and Tools for Early Post-Earthquake Assessment

(STEP, 2009) Program, recently developed as an abbreviation of the Italian program, is similar to California's ATC-20-based Safety Assessment Program (SAP). It focuses on safety assessments (red, yellow and green tagging) and adds recommendations for short-term safety countermeasures.

The Italian program, called Post-Earthquake Damage and Safety Assessment and Short Term Countermeasures (AeDES), is considerably more detailed than SAP. Its purpose is to "survey the typological characteristics, damage, usability, and repair or retrofit needs of residential buildings in the emergency phase following an earthquake." It provides a mechanism to characterize the extent and variability of the damage within individual buildings, an approach that may be adaptable to SEAO's EPEP procedures.

Italy also uses its AeDES forms to estimate property losses on an

aggregate basis, and has plans to calibrate the performance of existing buildings.

Japan's assessment program is described in its *Guidelines for Earthquake-Related Damage Survey of Buildings and Houses*. Unlike other participating countries, Japan's program calibrates the performance of building structural and nonstructural systems as well as retaining walls and slopes. Japan relies on a multi-phase evaluation process, starting with quick inspections of damaged buildings similar to SAP, followed by more detailed performance surveys, similar to those intended by EPEP.

The international exercise resulted in a productive exchange that should contribute to more unified and effective post-earthquake damage assessment procedures. For more information, see www.eeri.org/lfe/pdf/italy_molise_goretti_pasadena_paper.pdf, www.step.eu.com, isee.kenken.go.jp/eqtap/guide.htm, and "SEAO's Earthquake Performance Evaluation Program: an Update" in the 2009 *SEAO Convention Proceedings*.

News of the Profession

International Risk Reduction Goals

Eighteen hundred participants from 300 regional and national organizations and governments met in June at the Second Session of the Global Platform for Disaster Risk Reduction (DRR) in Geneva, Switzerland, ending with a call for political leaders to implement measures to reduce disaster-related deaths 50% by 2015.

Other goals set are to conduct global structural evaluations of all schools and hospitals by 2011, and by 2015 to develop and implement action plans for safer schools and hospitals in all disaster-prone countries, to have DRR included in all school curricula, and to include

and enforce DRR measures in building and land use codes in all major cities in disaster-prone areas.

For more information visit <http://www.iisd.ca/ymb/gpdr2/> and <http://www.preventionweb.net/globalplatform/2009/>.

Announcement

WSSPC Seeks Awards Nominations

The Western States Seismic Policy Council (WSSPC) is now accepting nominations for its 2010 Awards in Excellence, which recognize achievement in different areas of earthquake mitigation, preparedness, and response. State, provincial, and city governments as well as nonprofit

agencies are eligible. Since 1996, the awards have been an effective method to facilitate the transfer of exemplary programs, products, and policies to other organizations and to recognize the hard-working, creative, and innovative efforts within the earthquake hazards reduction community. The awards will be presented on July 9, 2010, at the WSSPC Annual Conference to be held in conjunction with the Natural Hazards Center Annual Workshop in Broomfield, Colorado.

Information and forms are at http://www.wsspc.org/Awards/2010_call_for_nominations.html. Nominations must be made by someone outside of the nominated agency and must be received in the WSSPC office by October 2, 2009.

Announcements

PEER Annual Meeting

The Annual Meeting of the Pacific Earthquake Engineering Research Center (PEER) will be held October 15–16, 2009 at the Intercontinental Mark Hopkins Hotel in San Francisco. This first annual meeting since PEER's graduation from NSF funding will highlight developments under new director Stephen Mahin, including the operation of laboratory facilities at UC Berkeley, new research projects, and future research directions.

Registration is requested in advance, but the two-day meeting is free and will include breakfast, lunch, and attendance at all plenary and breakout sessions. Students are encouraged to register and submit posters for the student poster reception at the Top of the Mark restaurant with stunning views of San Francisco.

The 2009 Annual Meeting is unique due to its concurrence with two other meetings: The 3rd International Conference on Advances in Experimental Structural Engineering and the one-day Loma Prieta Earthquake Commemorative Symposium (see the Calendar, page 11), which will be held on the 20th anniversary of the October 17, 1989, event. It will draw many researchers, practitioners, and public officials from the Bay Area and around the world.

For registration, hotel, and program information, visit http://peer.berkeley.edu/events/annual_meeting/2009AM/registration.html.

Performance-Based Plastic Design Course

The Structural Engineers Association of Northern California is sponsoring a two-evening course August 24 and 26, 2009, 6:00-9:00 p.m., on Performance-Based Plastic Design (PBD) of Earthquake-Resistant Structures, given by EERI member Subhash Goel, Professor Emeritus of Civil Engineering at the University of Michigan, Ann Arbor. PBD is a newly-developed design methodology applied to seismic design of steel and RC structures. Since drift and yield mechanism control are built into the design process from the very start, PBD is a direct design method without the need for iteration to achieve desired performance, and results in enhanced safety, especially under severe ground motions, as well as ease and economy of repair costs. The presentation will include background theory, step-by-step design procedure, and examples of commonly used framing systems. The course will be held in the office of Arup, 560 Mission Street, 7th Floor, San Francisco, CA 94105. The cost is \$150 for SEAONC and EERI members, \$250 for nonmembers, and \$50 for students. A recommended textbook is *Performance-Based Plastic Design: Earthquake-Resistant Steel Structure*, by Goel and Chao. Registration by August 17 is required and can be done by fax or e-mail by downloading a form from www.eeri.org or e-mailing office@seaonc.org.

10th Costa Rica Seminar

The Costa Rican Association of Structural and Earthquake Engineering (ACIES is its Spanish acronym) will hold its 10th Biennial Seminar in San Jose, Costa Rica, September 16-18, 2009. Although the language of the seminar is Spanish, most keynote speakers will deliver their lectures in English. Simultaneous translation (Spanish-English) may be made available if warranted by demand. Speakers include EERI members Stephen Kramer (U. of Washington), Finley Charney (Virginia Tech), Jose Restrepo (UC San Diego), Robert Frosch (Purdue U.), and Adolfo Matamoros (U. of Kansas), as well as many Costa Rican researchers and practitioners. For more information, visit <http://www.acies.or.cr/actividades.aspx>.

Call for Papers

Urban EQ Engineering Conference

The 7th Conference on Urban Earthquake Engineering (7CUEE) will be held March 3-5, 2010, at the Tokyo Institute of Technology. The 7CUEE aims to promote research that mitigates the seismic "mega" risk confronting the world's vast, modern cities in earthquake-prone regions.

The conference seeks to nurture young researchers through a sustained international collaborative effort. Sponsored by the Center for Urban Earthquake Engineering, the 7CUEE will be held jointly with the 5th International Conference on Earthquake Engineering (5ICEE), a quadrennial meeting of the Asian-Pacific Network of Centers for Earthquake Engineering Research (ANCER). The joint conference will establish a new multilateral research platform to disseminate state-of-the-art information.

Authors are encouraged to submit abstracts to one of four major themes by August 31, 2009:

- 1) vulnerability of megacities to seismic hazards;
- 2) multihazard mitigation solutions;
- 3) adoption of sensor, actuation, and control technologies within mitigation strategies;
- 4) educational initiatives that cultivate interdisciplinary and cross-cultural earthquake engineering curricula.

For more information, visit http://www.cuee.titech.ac.jp/Conference_2010/index.htm.



CALENDAR

Items that have appeared previously are severely abbreviated. The issue containing the first appearance, or the most informative, is indicated at the entry's end. Items listed for the first time are shown in bold.

AUGUST

13-14. ANCER Workshop, University of Illinois at Urbana-Champaign. Info: <http://illinois.edu/goto/ANCER> (2/09)

24 & 26. PB Plastic Design of EQ-Resistant Structures, San Francisco. See page 10. (8/09)

SEPTEMBER

2. Seminar on Next Generation Attenuation (NGA) Models, Seattle, WA. Info: www.eeri.org. See page 1. (5/09, 8/09)

3. Seminar on NGA Models, Oakland, CA. Info: www.eeri.org. (5/09, 8/09)

10. Seminar on NGA Models, Salt Lake City, UT. Info: www.eeri.org. (5/09, 8/09)

11. Seminar on NGA Models, Los Angeles, CA. Info: www.eeri.org. (5/09, 8/09)

13-17. 10th International Conference on Structural Safety & Reliability (ICOSSAR2009), Osaka, Japan. Info: www.sc.kutc.kansai-u.ac.jp/icosar2009 (2/08)

16-18. 10th Seminar on Structural and Earthquake Engineering (ACIES), San Jose, Costa Rica. See page 10.

17. Confined Masonry Construction Mini-Seminar, San Francisco. See page 3. (8/09)

20-23. 4th International Conference on Geohazards, Sun Moon Lake, Nantou, Taiwan. Info: <http://www.engconfintl.org/9ad.html> (5/09)

23-26. SEAOC Convention, San Diego, CA. Info: <http://seaoc2009.com/> (2/09)

28-Oct. 10. Advanced School on Nonlinear Dynamics and EQ Prediction, Trieste, Italy. Info: <http://agenda.ictp.it/smr.php?2060>

(4/09)

OCTOBER

2. AIA-EERI Forum on Designing for Earthquakes, Stanford University. See page 2. (8/09)

2-3. EQ Geotechnical Engineering Satellite Conference, Alexandria, Egypt. Info: mamsakr@yahoo.com (12/08)

5-9. 17th International Conference on Soil Mechanics and Geotechnical Engineering, Alexandria, Egypt. Info: <http://www.2009icsmge-egypt.org/> (12/08)

15-16. PEER Annual Meeting, San Francisco, CA. Info: http://peer.berkeley.edu/events/annual_meeting/2009AM/. See page 10. (3/09, 8/09)

15-16. 3rd International Conference on Advances in Experimental Structural Engineering, San Francisco, CA. Info: <http://peer.berkeley.edu/events/2009/icaese3/index.html> (7/09)

17. Loma Prieta Anniversary Event, San Francisco, CA. Info: http://peer.berkeley.edu/events/2009/loma_prieta/ (3/09)

NOVEMBER

11-14. XVII National Conference on Earthquake Engineering (Sociedad Mexicana de Ingeniería Sísmica), Puebla, Mexico. Info: <http://www.smis.org.mx/xvii/> (8/09)

10-15. 5th Congress on Forensic Engineering, Washington, D.C. Info: <http://content.asce.org/conferences/forensics2009/index.html> (12/08)

25-26. 7th International Probabilistic Workshop, Delft, The Netherlands. Info: www.elsevier.com/wps/find/newsdetail.cws_home/NWS_WN_nt00008088/essay (3/09)

DECEMBER

9-11. Improving the Seismic Performance of Existing Buildings and Other Structures, San Francisco, CA. Info: www.ATC-SEI.org (12/08, 7/09)

2010

FEBRUARY

3-6. EERI Annual Meeting, San Francisco, CA. Info: www.eeri.org (3/09)

MARCH

3-5. 7th Conf. on Urban EQ Eng. (7CUEE), Tokyo. See page 10.

APRIL

20-23. 2010 SSA Annual Meeting, Portland, Oregon. Info: <http://www.seismosoc.org/meetings/2009/specialsessions.html> (6/09)

MAY

22-27. X Chilean Conference on Seismology & EQ Engineering, Valdivia-Santiago, Chile. www.achisina2010.uchile.cl (5/09)

24-29. 5th International Conference on Recent Advances in Geotechnical EQ Engineering & Soil Dynamics and Symposium in Honor of I.M. Idriss, San Diego, CA. Info: 5geoeq-conf2010.mst.edu (4/08, 1/09)

JULY

11-15. 5th International Conference on Bridge Maintenance, Safety and Management (IABMAS), Philadelphia, PA. <http://www.iabmas2010.org> (11/08)

25-29. 9th U.S. National & 10th Canadian Conference on EQ Engineering: Reaching Beyond Borders, Westin Harbour Castle Hotel, Toronto, Canada. Info: 2010eqconf.org. See page 12. (2/08, 7/08, 1/09, 3/09, 6/09, 8/09)

AUGUST

30-Sept. 3. 14th European Conference on EQ Engineering (14ECEE), Skopje-Ohrid, Macedonia. Info: www.eaee.boun.edu.tr/eaee.htm (12/08)

SEPTEMBER

5-9. 32nd General Assembly of the European Seismological Commission (ESC 2010), Montpellier, France. Info: <http://www.esc2010.eu> (5/09)

2011

JUNE

27-July 8. XXVth IUGG Assembly, Melbourne, Australia. Info: <http://www.iugg2011.com/> (6/09)



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EERI Newsletter, August 2009 Volume 43, Number 8

News of the Institute

2010 Earthquake Conference News

Author Notices: Due to the abstract submission deadline extension and the terrific response represented by more than 1,400 abstracts submitted to the 9th U.S. National and 10th Canadian Conference on Earthquake Engineering, the goal of notifying authors of acceptance has been delayed. While notification has begun, the entire process may take until mid-August to be completed.

Technical Program Co-Chairs Shamim Sheikh and Catherine French appreciate the efforts of the reviewers as well as the authors' patience and their interest in participating in the conference scheduled for July 25-29, 2010, in Toronto, Canada.

Review Process: The review of abstracts is being conducted online

through the web site hosted by Mira Digital Publishing. It is possible that some messages sent by Mira may appear to be spam to some reviewers. Their messages come from **2010EQConf@mirasmart.com**, and they contain links to view the actual message. If you think you have received such a message and deleted it, please contact Eloise Gilland in the EERI office (**eloise@eeri.org**), and she can see that it is re-sent.

EERI to Bestow Alfred Alquist Medal

On December 9, 2008, the EERI Board of Directors formally accepted the California Earthquake Safety Foundation's transfer of the Alfred E. Alquist Medal to EERI. Beginning in 2010, this medal will be bestowed on behalf of EERI. The transfer was endorsed by the EERI's Honors Committee, which met this spring to formalize the process.

In his communication to the Board, Honors Committee Chair Tom O'Rourke noted that the commit-

tee recommends that the current EERI Special Recognition Award be renamed the Alfred E. Alquist Special Recognition Medal. The Alquist Medal is presented to "individuals, public agencies, corporations, charitable and other organizations that have demonstrated outstanding achievements ... in earthquake safety." These criteria align well with those of the EERI Special Recognition Award as "presented to an individual, company, or organization

that has made significant contributions to the field of seismic and earthquake risk reduction..."

The medal will be awarded by EERI for the first time at the EERI Annual Meeting in San Francisco, February 3-6, 2010. The Honors Committee welcomes nominations from the community by October 1. Please visit the Alquist Special Recognition Medal website: **<http://www.eeri.org/site/special-recognition>** for information on how to submit nominations.