Association of Engineering Geologists

"Serving Professionals in Engineering, Environmental and Groundwater Geology Since 1957"

Southern California Section

NEWSLETTER - January 1997

Dinner Meeting *Tuesday January 14th*

- ❑ **Stevens Steak House**
  5332 Stevens Place
  City of Commerce
- ❑ **Cost - $20.00**
  ($10.00 for full-time students with valid I.D.)
- ❑ **For reservations call (New Number!) Pat Stewart at Montgomery Watson at (818) 568-6161 by Friday January 10th**

Make reservations by Noon on the Friday before the Meeting

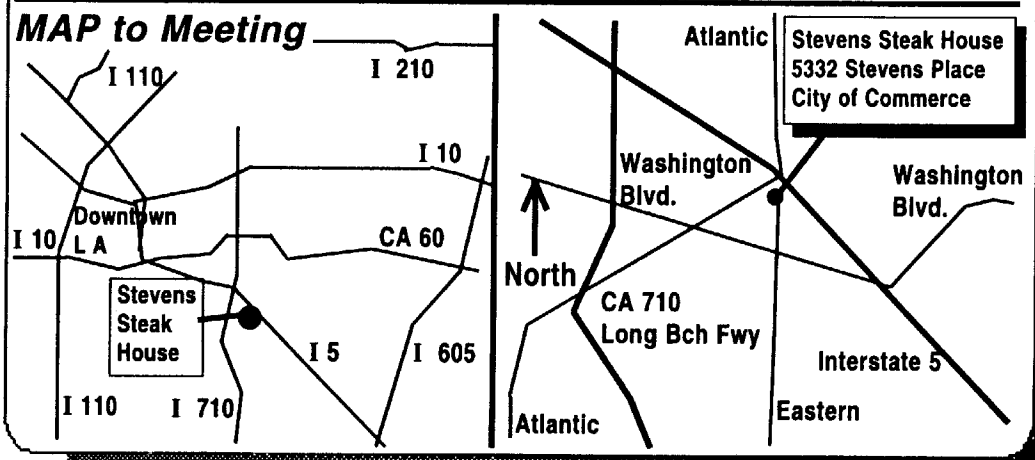
- ❑ **5:30 Social Hour & One-Half**
- ❑ **7:00 Dinner**
  7:30 Announcements
- ❑ **7:45 Program**

Program

TOPIC **Flexible Buildings in the Near-Source Area of Large Earthquakes**

SPEAKER **Dr. Thomas Heaton**
California Institute of Technology, Pasadena, California

MAP to Meeting



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Deadline for submittals to the February Newsletter:
January 27th

Next Meeting February 11th

Program Topic & Speaker

Flexible Buildings in the Near-Source Area of Large Earthquakes

Dr. Thomas Heaton

California Technical Institute, Pasadena, California

Although smaller earthquakes are far more numerous, large earthquakes (M > 7.5) account for most of the slip along plate boundaries. Large earthquakes are inevitable in regions such as California.

Large earthquakes have large fault slips and rupture areas, the average slip in a M 7.5 earthquake is on the order of 5 meters. These large slips will inevitably cause large ground displacements within a distance comparable to the maximum depth of the rupture. If the rupture propagates towards a site, then the ground motion will consist of one or more large pulses of displacement with amplitudes comparable to the fault slip. Seismological models of the fault rupture indicate that the duration of slip on a fault is relatively short; the average slip velocity is probably in the range of 2 m/sec. In fact, the median peak ground velocity for 30 ground motions recorded within 5 km of a variety of earthquakes ranging from M 6.5 to 7.3 is 105 cm/sec. Models of ground motions from large magnitude earthquakes indicates that similarly high (or higher) ground velocities will occur, but the ground displacements can be much larger. The upper bound on ground displacements during earthquakes may be quite large indeed. Near-source ground motions for large earthquakes are expected to have the long-period motions (> 1 sec) will be dramatically larger than has yet been experienced by flexible structures.

Flexible structures, such as tall buildings and base isolated buildings, have never been within 10 km of any earthquake larger than M 6.9, but they clearly will be in future earthquakes. Simulations of the response of flexible buildings to large magnitude earthquakes predicts large deformations that will cause irreparable damage in many building, and possibly collapse in others.

Thomas Heaton is a Professor of Engineering Seismology at Cal Tech with a joint position in the Division of Engineering and Applied Science and the Division of Geological and Planetary Science. He was a Research Geophysicist with the U.S. Geological Survey (USGS) in their Pasadena Office from 1979 to 1995, and was also the USGS Project Chief of the Southern California Seismic Network. He was the Scientist in Charge of the USGS Pasadena office from 1985 to 1992 and was also the Coordinator of the USGS earthquake program in Southern California. He received a Meritorious Service Award from the U.S. Dept. of Interior in 1995.

He is a past President of the Seismological Society of America and was the Co-chairman of the Southern California Earthquake Center Working Group on the Probabilities of Future Earthquakes in Southern California. He currently serves in the Mayor's Blue Ribbon Panel on Seismic Hazard Reduction for the City of Los Angeles. He has written numerous research papers in the fields of strong ground motion modeling, earthquake sources physics, earthquake hazards in the Pacific Northwest, earthquake warning systems, and tidal triggering of earthquakes. He received a B.S. in Physics from Indiana University, and a Ph.D. in Geophysics from Cal Tech.

THIS MONTH

January 1997

Kelly E. Rowe
Hydrogeologist

The meeting this month, Tuesday, January 14th, features a discussion on earthquakes, a topic which naturally interests Californians. Tom Heaton has spoken at our meetings before and he always has interesting things to say regarding regional earthquakes and seismic hazards. This topic is timely as recent newspaper articles describe the results of the investigations on the adequacy of the steel welds in the failure of many buildings following the Northridge Earthquake. Will some of the buildings using those welding materials now be condemned as hazardous or retrofitted to not be hazardous.

Last month Tania Gonzales, with Leighton & Assoc. in Irvine, spoke about the earthquake risk assessment that she, along with Eldon Gath, had recently completed for the San Bernardino Valley College campus. Part of the San Jacinto Fault (SJF), one of the largest faults in Southern California, underlies the southwestern portion of the campus. Following an investigation including historical data review, trenching, hollow-stem auger and cone penetrometer test borings, and geophysical profiles several existing buildings were identified to lie directly astride the main trace of the SJF. A near-surface blind thrust partitions off a compressional component forming an east-vergent fold that is parallel to, and 60 m northeast, of the main fault trace. The campus is using this investigation to plan for development of facilities, including building abandonment, relocation, or retrofiting.

Before Tania spoke Dave Ebersold started a discussion on the question of whether geologists should be required to have continuing education to maintain licensure in the state. Actually is started as a simple yes or not vote on the issue. The Board of Registration for Geologists and Geophysicists are, as are all boards in the state, rewriting the state act authorizing the board. The vote turned out to be primarily yes. I pointed out that most of the older professionals present voted no and during the following discussion points were raised on how it may be administered. The "no" voters thought it would simply not work by citing examples where fraudulent continuing education credits were awarded to friends or relatives in other professions and by saying California would have to "invent-the-wheel" for the administrative process.

As the Manager of the AEG Committee on Continuing Education and Short Courses I take exception to the "no" sayers. AEG is affiliated with the International Association for Continuing Education and Training (IACET) and through

Continued from page 2

our committee awards continuing education training credits to people who attend our short courses and seminars in full compliance with the IACET guidelines. These guidelines are serious and not trivial. If you care to discuss this issue further give me a call. As a "yes" sayer I note**many** in our profession who do not keep abreast with current thinking or who "forget" how to think and thereby not properly represent themselves as professionals. Being forced to obtain continuing education will only enhance the skills of us in the profession. We are fortunate to have a tremendous number of experts in our field in Southern California who are willing to share their knowledge with us to meet this need.

We do not have to "invent-the-wheel" for our Board. California should be the leader, *but is far behind several other states who have established state-board-administered guidelines for continuing education.* Our committee issues ceu credits to professionals in those states from other local AEG sections' and our annual meeting short courses so they can maintain their licences. We simply need to use the elements of the guidelines written in those states that are appropriate for us and establish the administration through the board.

This is another short newsletter. I promise that next month I will have two more pages to brighten your day. If you have information for the newsletter please feel free to call me. Otherwise send me e-mail at my KRowe@OCWD.com address.

Chairman's Column

Dave Ebersold

Happy 1997! Let me first start by wishing everyone a happy new year. I hope that your holiday season was filled with good health and happiness. I also hope that you are filled with the excitement and anticipation of the challenges and rewards that come with each new year. Our state's economy appears to be on a sustained upswing, the housing market is strengthening, industries such as entertainment and high tech manufacturing are reshaping our workforce, and the aerospace industry no longer represents a drain on our resources. In addition, growth projections for southern California over the next decade indicate strong upward trends. What does all of this mean? It means that bright days are ahead with anticipated strong housing demands and, as always, ever more pressure on our limited water supply. Change, change, change; life's only constant. It also means opportunities for geologists!

Another aspect of change, and one which I anticipate continuing, is an ongoing evolution of our profession. The geologic sciences are filled by an ever-increasing body of knowledge which places new and unique demands on each of us to stay at the forefront of our technology. Our clients are also more sophisticated and demand higher value for their limited dollars with each passing day. The demands on each of us, whether consultants, regulators, or clients, suggest that innovation, creativity, and embracing change will yield the greatest potential for success in our "new" marketplace.

OK, different topic now. Over the past couple of months, I have had the opportunity to hear some of your concerns, gripes and suggestions. However, I can count the number of people who contribute these on one hand. I also must admit that I am shorter on suggestions than I would like to be. What do you think of the speakers we've been having? Do you have suggestions for others? Is there a field trip you'd like to see organized or a short course you'd like to be able to attend? Is there something you'd like to see done differently? Are you tired of hearing and talking about serious issues at meetings? Would you be willing to present a short topic on an interesting project you've been working on? Call me, talk to me, email me.

Other stuff. At its January meeting, the San Francisco Section of AEG will be presenting Bob Tepel, on behalf of all three California AEG Sections, with an award for the literally hundreds and hundreds of hours he spent fighting to keep our Board from being sunsetted last year. We all owe Bob a huge thank you!!!!! And now the next step. To build our defenses for the next round, to increase communication and cooperation among the variety of geologists practicing throughout the state, and to increase our strength as a profession, plans are underway to form a new organization whose only members are organizations themselves, preliminarily called the California Council of Professional Geologists. The first organizational meeting for this new group will be held in northern California in early January and I will be attending as your representative. Much more to come on this topic in the coming months!

In the meantime, I look forward to seeing you all on January 14th at Steven's Steak House!

Association of Engineering Geologists
Southern California Section

Kelly E. Rowe
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FIRST CLASS POSTAGE