Invitational Workshop on Steel Seismic Issues

September 8-9, 1994
Los Angeles International Airport Renaissance Hotel
Los Angeles, California

PROCEEDINGS

Structural Engineers Association of California
Applied Technology Council
California Universities for Research in Earthquake Engineering

Invitational Workshop on Steel Seismic Issues

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Acknowledgments

SAC is a joint venture of the Structural Engineers Association of California (SEAOC), the Applied Technology Council (ATC) and the California Universities for Research in Earthquake Engineering (CUREe). An Invitational Workshop on Steel Seismic Issues was conceived as a first step towards the resolution of the problems posed by observed performance of steel moment frames in the Northridge earthquake.

Ronald F. "Rawn" Nelson of Myers, Nelson, and Houghton, Inc. and 94-95 SEAOC President-Elect, was the driving force behind organizing and conducting the Workshop.

The Organizing Committee was comprised of:

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H.S. Lew

John Gross

The Workshop could not have been a success without the dedicated and active participation of the over 100 professional engineers, researchers, and public employees who so generously and graciously gave of their time and expertise to make the Workshop a success. These professionals gave of their time and intellect for the common good of the profession and the enhanced safety of those who live and work in steel structures. This is a continuation of the long established tradition of volunteer participation that has come to characterize the structural engineering profession. To the participants, the organizers give their sincerest appreciation.

Finally, we wish to give our appreciation and thanks to the sponsors who provided the financial means for the conduct of the Workshop: American Institute of Steel Construction (AISC), American Iron and Steel Institute (AISI), and National Institute of Standards and Technology (NIST), which provided not only financial contributions but also sponsored the information-gathering survey on damaged steel buildings by Nabih Youssef and Associates and reported at the Workshop. The contributions and support of these and many other institutions and organizations (listed below) are also greatly appreciated.

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American Welding Society

Memorial Dedication to Dr. Geerhard Haaijer

The untimely death of Dr. Geerhard Haaijer deprived the SAC Steel Program Organizing Committee of his continued contributions to the planning and conduct of the Invitational Workshop. He ably represented the American Institute of Steel Construction on the Organizing Committee, and his loss was sorely felt.

Dr. Geerhard (Gerry) Haaijer was AISC Vice President of Technology and Research at the time of his death on August 20, 1994. During his 11 years as Vice President of AISC, Dr. Haaijer was actively involved as a leader in both the domestic and international steel industries. He published numerous papers and served actively on many professional committees for several organizations in civil engineering. Before joining AISC in 1983, Dr. Haaijer was employed by the U.S. Steel Corporation's Research Laboratory for 27 years, including a 17-year tenure as Chief of the Design Technology Division. Dr. Haaijer was also an adjunct professor in the Department of Civil Engineering at Carnegie-Mellon University in Pittsburgh, Pennsylvania, where he taught courses in structural engineering and mathematics. Dr. Haaijer was a native of the Netherlands, and received his professional degree in Civil Engineering in 1952 at the Technical University at Delft, the Netherlands, and his doctorate in Civil Engineering from Lehigh University in Bethlehem, Pennsylvania in 1956.

Dr. Haaijer's research included plastic design, hybrid girders, new fire protection methods, cold-formed steel framing for residential structures, finite element analysis and autostress design of steel bridges. In response to the steel moment connection problems identified in the Northridge earthquake, Dr. Haaijer was instrumental in organizing steel industry response and research. He served as Chairman of the AISC Advisory Committee on this topic for the last several months.

While his presence and leadership will be sorely missed, his career achievements and technical contributions will long remain. The Organizing Committee dedicates this volume to his memory as a small token of his contributions, not only to the Workshop, but to the structural engineering profession.

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The SAC Joint Venture

SAC is a joint venture of the Structural Engineers Association of California (SEAOC), the Applied Technology Council (ATC) and the California Universities for Research in Earthquake Engineering (CUREe). This joint venture uniquely combines the strengths and resources needed to resolve difficult technical problems in the field of earthquake hazards mitigation and professional practice.

SEAOC is a professional organization representing more than 5,000 structural and other professional engineers active in the field of earthquake engineering. SEAOC committees have a long tradition of developing effective provisions for design of seismic resistant structures and for investigating the causes of damage resulting from earthquakes. The joint venture is chaired by SEAOC.

CUREe is an educational and research organization comprised of the eight major earthquake engineering research universities in California as well as individual members from other universities and private practice. These universities and associated faculty are world renowned for their expertise and contributions in the field of seismic resistant design and analysis. The experimental and analytical facilities available through the participating universities are among the very best in the world, including the largest shaking table and reaction wall in the U.S.

ATC is a professional organization with a distinguished history in the management of large and complex research programs on structural engineering issues. Previous efforts by ATC have resulted in the development of major recommendations for model codes for new buildings, for evaluation of damaged buildings and for rehabilitation of existing buildings.

Questions or inquiries regarding this program should be addressed to Arthur Ross in care of the Structural Engineers Association of California.

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