Seismic Design and Performance Of Building Structures

Purpose and Background

Seismic engineering is one of the most rapidly evolving disciplines in the civil/structural engineering profession. Recent seismic events around the world have provided new insight into the way structures perform when subjected to earthquake-related ground motion. In the U.S., these events have focused the attention of government agencies, code bodies, insurance companies, the scientific community and the public on safety hazards and potential losses associated with structures that perform poorly during earthquakes. As a result, there is growing national emphasis on seismic risk assessment, seismic design requirements for new structures, and seismic retrofit of existing structures.

Seismic provisions of model building codes have been extensively revised and many west coast communities have adopted certain mandatory seismic upgrade requirements, and at least one state has instituted specific earthquake-related licensing requirements for professional engineers. Many structural engineers have limited experience concerning the behavior of structures subjected to strong ground motion. In addition, most building code seismic design provisions are prescriptive in nature and provide little or no insight into actual structural performance.

This two-day seminar introduces the principles of seismic design and performance. The instructors make extensive use of experience and practical applications of earthquake engineering to give participants a solid foundation in seismic design philosophy and the basic tools necessary for evaluating seismic performance of new and existing structures.

Seminar Instructors

Howard J. Hill, Ph.D., P.E., S.E., M.ASCE, is Director of Technical Operations, Wiss, Janney, Elstner Associates, Inc., Northbrook, Illinois. Dr. Hill’s primary area of practice involves evaluation of existing structures and structural failures. His earthquake engineering experience includes numerous damage assessment projects, detailed seismic evaluations of proposed and existing structures, design of comprehensive repair and retrofit programs, and peer reviews. He has lectured extensively on seismic design and performance. He is a member of the Earthquake Engineering Research Institute.

William J. Nugent, P.E., S.E., Manager of the Structural Engineering Group, Wiss, Janney, Elstner Associates, Inc., Northbrook, Illinois, has more than 20 years’ experience in evaluation and repair of damaged or distressed structures. Mr. Nugent was heavily involved in the field examination and design of repairs for structures damaged during the 1989 Loma Prieta and 1994 Northridge earthquakes. He has lectured on seismic performance, non-destructive testing, and structural failure. He is a member of ASCE and ASTM.

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Seminar Benefits

- Acquire techniques for enhancing seismic performance of existing structures and new construction
- Identify the differences between seismic loading and other forms of structural loading
- Recognize how to apply simple principles of structural dynamics in seismic design and analysis
- Understand the role of ductility in seismic performance and the use of response spectra
- Explore characteristics of lateral load resisting elements and load paths
- Understand the purposes and limitations of current building code seismic provisions
- Advance skills for assessing seismic behavior of existing structures
- Each participant will receive a copy of “NEHRP Recommended Provisions for the Development of Seismic Regulations for New Buildings,” course notes and references

Who Should Attend?

Structural engineers with little or no experience in seismic engineering will learn the basics of the current approach to design and evaluation of structures subjected to earthquake loading.

Structural engineers experienced in the use of building code provisions for seismic design will benefit from the segment on code philosophy and limitations and the sessions devoted to performance and evaluation of existing structures.

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