

# Linbeck Distinguished Lecture Series

## in Earthquake Engineering: Challenges of the New Millennium

*Bringing together practitioners and researchers to tackle the challenges  
of protecting our nation's infrastructure against seismic hazards*

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## The Search for the Perfect Seismic Protection System

**Friday, March 22, 2002**  
**4PM – C100 Hesburgh Center Auditorium**  
**Reception to follow the lecture**

Seismic design of buildings has slowly evolved over the centuries by a trial and error process. Initial progress resulted from altering building methods in response to observed earthquake damage. In recent decades the process of change has been governed primarily by formal research in structural laboratories and institutes.

The trend in the early 1900's was to use conventional building technology with minor modifications to account for earthquakes. In the past 50 years the primary focus has been the study and enhancement of conventional systems and element connections.

In the 1990's the development and use of seismic energy dissipation mechanisms, such as link devices, dampers, and base isolation, has gained widespread interest and is increasingly being used to advantage to protect buildings from earthquakes.

The challenge confronting performance-based design is reconciling the conflict of "displacement"; minimum displacement is required for damage control, while maximum displacement is required for favorable energy dissipation. This seismic displacement contradiction must be solved to attain the desired level of seismic protection in structures.

This paper outlines potential new directions which utilize mechanisms for energy dissipation and favorable building forms and configurations, all with the goal of developing predictable and favorable seismic performance.