# editorial

## ASCE/SEI 7-2005

### The Evolution of a Standard…

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Our economy relies on standards. We take many standards and their effects for granted – we expect every electric appliance to have a plug that fits into and a system that functions with the power provided by the outlet in the wall of our home or office. A host of standards drive our structural engineering practice – properties of materials, available sizes and shapes, and, of course, rules for design.

By the time you read this, the 2005 edition of ASCE/SEI 7 *Minimum Design Loads for Buildings and Other Structures* should be in print. Within months, the 2006 editions of the International Building Code and NFPA's *Building Construction and Safety Code* will appear, and gradually state and local jurisdictions will adopt these documents as the basis for their building regulations. As this unfolds, structural engineers around the country will discover that ASCE/SEI 7 will play a new and larger role in their professional lives. ASCE/SEI 7 will be the primary document governing seismic design, adding to the strong role it has played in recent years for wind, snow, and other loads. This will mark a milestone in the evolution of this standard, once known by the designation ANSI A58.1.

ASCE/SEI 7 is prepared by a committee that operates under ASCE rules, which are reviewed and accredited by ANSI, the American National Standards Institute. These rules allow input from any interested party. They assure that the decision-making committee is balanced among the various stakeholders, that the agreement among the committee is substantial, and that any dissent, from within or outside the committee, is carefully considered and resolved. The rules do not deliver unanimity, an impossible goal. The process and the governing rules deliver the best standard available given the realistic constraints of time and the tireless effort of over 100 volunteers who serve on ASCE/SEI 7 and its task committees.

Standards should change slowly – the entire concept of a standard is based upon a decision made once and then repeated and repeated for economy. Ironically, if standards never change, especially standards of technology and commerce, then the economy ossifies. So standards must balance the status quo and change. It is the sense of the leadership of ASCE/SEI 7 that the recent cycles of change have been too rapid. Therefore, we have formally adopted a plan that our next edition will be completed for the 2012 cycle of model building codes, not the 2009 cycle.

In anticipation of more widespread use of the seismic design portion of ASCE/SEI 7, the seismic task committee began a major effort in 2003 to streamline those provisions. Every provision was examined, most were moved to a new location, many were rewritten to more clearly communicate the intent, and considerable redundant expression was deleted. The result will look very different to engineers familiar with earlier editions of ASCE/SEI 7. Early reviews have been favorable, and after a brief learning period we expect that most users will appreciate the reorganization and editing of the seismic provisions.

There have also been changes of substance in the seismic provisions. We have added a new simplified method of analysis and design for simple buildings. Built upon an initiative at the Building Seismic Safety Council, the method is limited to buildings with well configured seismic resisting systems. Beyond the obvious intent to avoid complexity where it isn't necessary or beneficial, the method is crafted to encourage building forms that have performed well in past earthquakes. And, we have made some more progress toward our oft-stated goal of removing material-specific design provisions from ASCE/SEI 7.

Provisions to supplement material design standards for selected seismic resisting systems appeared in ASCE 7 in the 1993 edition. That was the first edition to incorporate the new generation of seismic design. These provisions made explicit to the design engineer the fact that the specified design forces were based upon a reduction from linear elastic response made possible by post-yield behavior (damage) of selected structural elements. That fact coupled the two sides of the general design equation: resistance shall exceed load effect. For most other design situations, the design limit state is just at the end of linear behavior, so resistance and load effect are still uncoupled. Economy in seismic design doesn't permit such a simplistic approach, so an era demanding even closer cooperation between the various groups preparing standards for structural design. Such cooperation is not always easy or smooth, because the committees have different demands placed upon them as well as some differences in their objectives. But all share the obligation of providing for public safety and serving our profession. In my view the cooperation has been admirable.

All this emphasis upon the seismic design provisions might lead one to believe that there is no change in the remainder of the standard, but that would be a mistake. There have been improvements throughout – more detail on the classification of structures by use, more extensive maps for atmospheric icing, and much more. Thanks are owed to all who worked on it and to all who helped by making comments and recommendations along the way. And when you see the 2005 edition, note our special thanks to James M. Delahay, a committee member who made key contributions to improving the usability of the standard and who passed away last spring at a tragically young age.▪