

BOOK REVIEW

Simplified Building Design for Wind and Earthquake Forces

Reviewed by Thomas F. O'Conner, AIA, FASTM, Smith, Hinchman & Grylls Associates, Inc., Detroit, MI 48226.

REFERENCE: Ambrose, J., Vergun, D., *Simplified Building Design for Wind and Earthquake Forces, Third Edition*, John Wiley & Sons, Inc., New York, 1995, ISBN: 0-471-30958-3, 355 pp.

If you are not highly trained or experienced in engineering work, yet are interested in a practical and comprehensive treatment of the effects of lateral forces (wind and earthquake) on buildings, this book should prove beneficial. With this in mind, the authors have developed a basic text or self-study resource directed towards architects, builders, landscape architects, students, and others involved in the design and construction of buildings.

In general, a knowledge of simple geometry and algebra is sufficient for understanding most of the mathematical presentations provided in the text and the design and calculation examples. A knowledge of statics, elementary strength of materials and the design of simple elements of wood, steel, and concrete structures for buildings, as obtained by most professionals in college courses, is required for an adequate understanding. Knowledge of common materials and methods of building construction is undoubtedly helpful.

The book's contents are conveniently and logically arranged under four major parts or headings. "General Considerations" offers a discussion of the effects of wind and earthquakes on buildings, the resistance of buildings to lateral forces, and planning buildings for lateral resistance. "Lateral Resistive Elements and Systems" describes lateral-load-resisting systems and their elements as well as special problems and site and foundation concerns. "Design Examples" includes the process and methods of design examples for systems such as shear walls, trusses, and moment-resistive frames. "Strengthening of Building Structures" provides a discussion of the need for strengthening older structures.

The remainder of the book contains: a Glossary; four Appendices on dynamic effects; excerpts from the 1994 Uniform Building Code; data for masonry structures and weights of building construc-

tion; a section with Study Aids; a Bibliography and two Indexes, one general and the other for the design and investigation examples included in the text.

Part I, "General Considerations," and Part II, "Lateral Resistive Elements and Systems," provide the typical student or professional with a sound beginning towards understanding the effects of lateral forces on building design and construction. The authors have presented the information in a very readable and clear format with good use of figures and formulas to supplement the text and assist the reader in obtaining a clear understanding.

Part III, "Design Examples," is well organized and presents typically encountered design problems as discussion and calculation examples. The design emphasis is primarily for low-rise buildings that have relatively simple forms. Frequently, the same building form is used for the presentation of alternative lateral bracing solutions.

The need for strengthening older buildings is addressed in Part IV. This section is particularly relevant today with the increasing adaptive reuse of older structures proving to be economically viable. The section begins as a discussion on learning from experience, progressing to types of strengthening needed and methods of strengthening. I found the "Study Aids" section of the book to be especially useful to help determine the degree of comprehension and skill development obtained from studying a particular chapter of the book.

Most of the book is based on provisions of the 1994 Uniform Building Code (UBC) although other building codes should also prove applicable. A thorough review and comparison of other codes with UBC provisions is essential to reconcile differences, however.

The authors point out that the scope of the book is limited and the material is directed towards those in the early stages of studying the design of structures. Architectural designers and students of architecture in particular should find this book useful. It will provide them with a basic understanding of the effects of lateral forces and how to design a building to accommodate the building elements and systems required for resistance of these forces.

For those whose work is limited to the relatively simple situations presented in the book, mastery of the concepts should provide useful working skills. Those involved with more complex building situations will need to study more advanced materials or understand their limitations and engage a design professional specializing in such design.