

Book Reviews

Structural Modeling and Experimental Techniques, by Gajanan M. Sabnis, Harry G. Harris, Richard N. White, and M. Saeed Mirza, Prentice-Hall, Inc., Englewood Cliffs, N.J., 1983, 585 pages.

REVIEWED BY RICHARD E. KLINGNER¹

Sabnis, Harris, White, and Mirza have produced a book with many useful attributes. In addition to presenting a clear and comprehensive treatment of the factors involved in testing reduced-scale structural models, the book is also a useful reference on many aspects of structural testing in general. Many concepts are illustrated using practical examples, providing a clear picture of the kinds of information that can advantageously be obtained from model tests.

The authors begin with a discussion of the usefulness of model studies vis-a-vis analytical studies, noting that well-designed models can in some cases provide more accurate information than that available from modern nonlinear structural analysis programs, and can also help the analyst concentrate on those aspects of structural response which are most significant for design purposes. The book then continues with a clear discussion of classical similitude (Buckingham's Pi Theorem), followed by a presentation of the specific factors involved in modeling elastic materials. An entire chapter each is devoted to inelastic models of concrete and

masonry structures, and also of steel structures. These topics are particularly relevant, for example, to modern studies of the inelastic response of complex structures to earthquake loads.

The next portion of the book contains an informative description of loading and instrumentation principles, devices, and techniques. This section is of interest to any investigator of structural response, whether or not reduced-scale models are employed. The information is a useful introduction to experimental testing in general, explaining ways of loading specimens and measuring their response. The discussion of electrical resistance strain gages is very good, and provides sufficient background to enable an investigator to pursue the subject further if desired.

The next part of the book discusses some of the statistical tools involved in the interpretation of experimental data, and contains examples of the procedures used to assess the accuracy of such data. These last two topics (loading and instrumentation, and data analysis) are tremendously useful to all experimental researchers, and often hard to find in one convenient place.

The book closes with a presentation of numerous case histories involving experimental models, a review of additional factors involved in modeling for dynamic response, and a comprehensive, modern bibliography.

In summary, this book is a very useful resource for anyone interested in experimental structural research, and particularly so for those interested in research using reduced-scale models. It would be an excellent text or reference for a graduate or advanced undergraduate course on experimental methods in structural engineering.

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