BOOK REVIEW

FUNDAMENTALS OF EARTHQUAKE ENGINEERING

by N. M. Newmark and E. Rosenblueth

(Prentice Hall, 1971, 640 Pages)

Those familiar with Newmark's and Rosenblueth's very considerable contribution to earthquake engineering looked forward with great interest to this first comprehensive text book dealing with the subject as an integrated whole. Readers cannot be other than impressed by the skill and care devoted to the complete, unified and topical treatment of earthquake engineering principles.

Part I is devoted to dynamics. Chapters on Simple Linear Systems, Linear Systems with Several Degrees of Freedom, Linear Systems with Distributed Mass, Numerical Computation and Non-linear Systems precede one on Hydrodynamics. Each presents the fundamental concepts and mathematical development in a readily followed form, but with both the emphasis and the examples orientated to earthquake engineering applications. Part I includes illustrative problems and their solutions at the end of each chapter. The content and form of this section of the book make it extremely valuable as a recommended text for a civil engineering dynamics course at senior undergraduate or graduate level.

Part II contains chapters devoted to earthquake motions, dynamic structural effects and the concepts essential to the design of earthquake resistant structures. Chapters on Earthquake Characteristics, Seismicity, Probability Distributions of Response Spectra Ordinates and Responses of Linear and Non-linear Systems are included. A particularly good section on the behaviour of Materials (including Soils) and Structural Components under Earthquake Loading leads into Part III of the book covering Design.

In this final portion both basic concepts and practical applications of earthquake resistant design are presented. Codes are examined and design decision-making is discussed. In addition to the more usual building structures, reference is made to Towers, Stacks, Bridges, Retaining Structures, Tunnels and Pipes.

A comprehensive reference list is included in addition to appendices covering the calculation of dynamic parameters from natural modes of vibration and details of the Modified Mercalli Intensity Scale.

The reviewer knows of no other comparable single source of earthquake engineering fundamentals. Consequently this book is likely to be recommended reading for all earthquake engineering courses. Its production is consistent with the high standard of top ranked North American technical publishers. Newmark and Rosenblueth's text is likely to retail in New Zealand at around $30.00. Even at this price it will be found indispensable by all practising engineers who are seriously engaged in seismic resistant design.

The authors are to be congratulated in filling a gap in the technical literature with such an authoritative, yet readable, text.

R. Shepherd