

GENERAL INFORMATION

BOOK REVIEW

"Reinforced Concrete Structures" by R. Park and T. Paulay, 769 pp., illus., (John Wiley and Sons, New York, 1975. Price £14.60 in Great Britain and \$27.50 in U.S.A.)

This book is developed from two editions of notes "Ultimate Strength Design of Reinforced Concrete Structures" which were produced by the authors for extension study seminars for practicing engineers at the University of Canterbury.

The seminars were held to explain the basic behaviour of reinforced concrete elements and structures. Fundamental knowledge is required for an understanding of the strength and deformation characteristics up to ultimate load, which is necessary to enable the engineer to rationally assess design procedures. The constant changes and up-dating of Code requirements makes it necessary for the engineer to have a thorough knowledge of the materials he is dealing with.

The first part of the book is devoted to basic design criteria and the properties of concrete and steel. The strength and deformation of elements with flexure, flexure and axial load, shear and torsion are presented in considerable detail, followed by a discussion on bond, anchorage, and service load behaviour, in particular related to deflection and crack control.

The second part of the book deals with the design of frames and shear walls, and the detailing of structural components and joints.

Extensive reference is made to the A.C.I. Code provisions but reference to other codes is given where required. Throughout the book, practical examples ensure that the reader obtains a first-hand appreciation of the subject matter.

The distinction between this book and other text books on reinforced concrete design is the emphasis which is given to the deformation of members and structures. In (ultimate) strength design, it is important to ensure that the structure will behave in a ductile manner. This will allow a limit design approach but is particularly important for seismic resistant design. Ultimate strength design allows the designer to assess the ductility of the structure in the post-elastic range. The recommendations for seismic loading in building codes can only be justified if the structure has sufficient ductility to absorb and dissipate energy by post-elastic deformations when subjected to several cycles of loading well into the yield range. Throughout the text, the authors emphasise this important concept

in a manner which ensures a very clear understanding of this basic concept. The curvature ductility factor of members is compared with the displacement ductility factor for a structure. The principle of capacity design is explained and particular attention is given to confining details. The importance of good detailing is now generally recognised to be one of the most important elements to ensure satisfactory seismic resistant behaviour of structures and this book provides the most up-to-date theoretical and practical considerations related to the latest research information. The theoretical considerations are compared with results obtained from experiments. Many of these experiments have been carried out at Canterbury University under the guidance of the authors and have been reported in the Bulletin over the past years.

The publication of this book nearly coincides with the expected arrival of the new New Zealand loading provisions.

These new provisions incorporate many of the design considerations which are contained in the book. This is not surprising as the authors have made a valuable contribution to much of the new material contained in the new loading code. Their research work in Canterbury has had a fundamental effect on the progress made in seismic engineering in New Zealand.

Their work in regard to the design of shear walls, and in particular, the use of diagonally reinforced, ductile coupling beams in coupled shear walls is unique in the world. This is recognised in the new Code with the structural type factor for these shear walls which has been made similar to ductile frames.

After Blume, Newmark and Corning, this book should be regarded as a further step towards our better understanding of earthquake design in reinforced concrete. All authors of technical books face the danger that much of the information provided gets out of date very quickly and is overtaken by the rapid developments which are taking place.

The fundamental approach adopted in this book ensures that the user will find that further research will serve to complement rather than supersede what has been presented.

The book will be used as a valuable reference book by students and practicing engineers who want to have an insight into the earthquake effects on reinforced concrete buildings.

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