REVIEWS OF TECHNICAL PUBLICATIONS

Concrete Primer, Fifth Edition

Bryant Mather and Celik Ozyildirim

For nearly 75 years, this ACI special publication has provided simple answers to fundamental questions about concrete technology. First published in 1928, the *Concrete Primer* (SP-1) is still one of ACI's most informative. This new 2002 edition continues the traditional question-and-answer format of the first edition, written by F.R. McMillan and later revised by Lewis Tuthill. The primer answers more than 200 questions spanning a broad range of subjects, including: concrete properties and ingredients; structural design; activities prior to and during construction; post-construction evaluation, maintenance, and repair; and testing, both in the lab and on the jobsite. The publication is for anyone new to the complexities of concrete, but it also serves as a useful reference for seasoned concrete producers, designers, and field personnel.

American Concrete Institute, P.O. Box 9094, Farmington Hills, MI 48333-9094, www.concrete.org, 84 pp., $28.00 (ACI members), $46.50 (nonmembers).

Combined Torsion and Bending in Reinforced and Prestressed Concrete Beams

Khaldoun N. Rahal and Michael P. Collins

This study presents an evaluation of the Modified Compression Field Theory (MCFT) for combined bending and torsion. A recently developed theoretical model for combined shear, torsion, and other stress resultants based on this theory is modified to better capture the effects of the varying longitudinal strains in members subjected to bending. The calculated response and ultimate capacities are compared with the experimental data obtained from two available comprehensive test programs that cover under- and over-reinforced hollow and solid prestressed and nonprestressed concrete beams subjected to combined torsion and bending. The calculated deformations and ultimate capacities agree closely with experimental results.

ACI Structural Journal, V. 100, No. 2, March-April 2003, pp. 157-165.

Cyclic Loading of Ductile Precast Concrete Beam-Column Connection

Ali R. Khaloo and H. Parastesh

An experimental study was carried out to investigate the connection behavior subjected to cyclic inelastic loading. Four precast beam-column interior connections and one monolithic connection were tested. The variables examined were the connection length of reinforcements and presence of transverse bars at mid-height of connection. The specimens were tested with the column under a constant axial compressive load and reverse cyclic loading in accordance with a prescribed displacement history. Connection performance is evaluated on the basis of ductility, energy dissipation capacity, connection strength, and drift capacity. Based on the test results, the precast connection is capable of matching or exceeding the performance of the monolithic connection and thereby provides moment-resisting behavior.

ACI Structural Journal, V. 100, No. 3, May-June 2003, pp. 291-296.

Concrete Structures in the 21st Century

These proceedings are from the first *fib* Congress in Osaka, Japan, October 14 to 18, 2002. The proceedings are available in three variations. Proceedings 1 is a 1574-page, two-volume hardcopy version that contains 13 plenary and primary papers in full length and 668 two-page abstracts; it also includes a CD-ROM with all full-length papers. Proceedings 2 is a CD-ROM version that includes all accepted papers in full length. Proceedings 3 is a ten-volume hardcopy set of all papers in full length. All offerings are available from the Japan Prestressed Concrete Engineering Association (e-mail uchiyama@jpcea.or.jp).

Fédération Internationale du Béton (*fib*), Case Postale 88, CH-1015 Lausanne, Switzerland.

ACI 318-02 in Practice

Tran Manh Tuan

Revisions to ACI 318-02 from the previous edition include changes in load factors and strength reduction factors, which were revised to be consistent with ASCE 7-98. For the design of reinforced and prestressed concrete structural members, the Code also introduces the concepts of "compression-controlled" and "tension-controlled" sections. This article summarizes the strength reduction factors to be used for design of reinforced and prestressed concrete members, as well as reinforcement ratios for flexural design.

Concrete International, V. 25, No. 5, May 2003, pp. 71-75.

Scaling of Structural Strength

Zdenek P. Bazant

This publication delves into the relationship between experimental research, material modeling, structural analysis, and design. It focuses on the effect of structure size on structural strength and failure behavior. Until recently, all the observed size effects were considered statistical, but the author has shown that in quasi-brittle materials they are mainly energetic, caused by propagation of large fractures or damage bands. Developed initially on the basis of experiments on concrete, Bazant's theory recently found wide application to all quasi-brittle materials. This book will be of interest and use to advanced students and practitioners involved in mechanics and the study of strength in structures.

Taylor & Francis Publishing, Inc., 29 West 35th Street, New York, NY, 10001-2299; $95.00.