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Fibre Reinforced Cementitious Composites, Second Edition Arnon Bentur 2006-11-16 Advanced cementitious composites can be designed to have outstanding combinations of strength (five to ten times that of conventional concrete) and energy absorption capacity (up to 1000 times that of plain concrete). This second edition brings together in one volume the latest research developments in this rapidly expanding area. The book is split into two parts. The first part is concerned with the mechanics of fibre reinforced brittle matrices and the implications for cementitious systems. In the second part the authors describe the various types of fibre-cement composites, discussing production processes, mechanical and physical properties, durability and applications. Two new chapters have been added, covering fibre specification and structural applications. *Fibre Reinforced Cementitious Composites* will be of great interest to practitioners involved in modern concrete technology and will also be of use to academics, researchers and graduate students.

Developments in the Formulation and Reinforcement of Concrete Sidney Mindess 2019-06-26 *Developments in the Formulation and Reinforcement of Concrete, Second Edition*, presents the latest developments on topics covered in the first edition. In addition, it includes new chapters on supplementary cementitious materials, mass concrete, the sustainability of concrete, service life prediction, limestone cements, the corrosion of steel in concrete, alkali-aggregate reactions, and concrete as a multiscale material. The book's chapters introduce the reader to some of the most important issues facing today's concrete industry. With its distinguished editor and international team of contributors, users will find this to be a must-have reference for civil and structural engineers. Summarizes a wealth of recent research on structural concrete, including material microstructure, concrete types, and variation and construction techniques Emphasizes concrete mixture design and applications in civil and structural engineering Reviews modern concrete materials and novel construction systems, such as the precast industry and structures requiring high-performance concrete

Fiber-Reinforced-Plastic (FRP) Reinforcement for Concrete Structures David A Hensher 2016-01-22 The use of fiber reinforced plastic (FRP) composites for prestressed and non-prestressed concrete reinforcement has developed into a technology with serious and substantial claims for the advancement of construction materials and methods. Research and development is now occurring worldwide. The 20 papers in this volume make a further contribution in advancing knowledge and acceptance of FRP composites for concrete reinforcement. The articles are divided into three parts. Part I introduces FRP reinforcement for concrete structures and describes general material properties and manufacturing methods. Part II covers a three-continent perspective of current R&D, design and code implementations, and technical organizations' activities. Part III presents an in-depth description of commercially-available products, construction methods, and applications. The work is intended for engineers, researchers, and developers with the objective of presenting them with a world-wide cross-section of initiatives, representative products and significant applications.

Concrete in the Marine Environment P.K. Mehta 1991-12-03 Concrete has clearly emerged as the most economical and durable material for the building of the vast majority of marine structures. Reinforced concrete too has overcome the technological problems making it a suitable material for the construction of advanced marine structures such as offshore drilling platforms, superspan bridges and undersea tunn

Fibre Reinforced Cementitious Composites, Second Edition Arnon Bentur 2006-11-22 Advanced cementitious composites can be designed to have outstanding combinations of strength (five to ten times that of conventional concrete) and energy absorption capacity (up to 1000 times that of plain concrete). This second edition brings together in one volume the latest research developments in this rapidly expanding area. The book is split into two parts. The first part is concerned with the mechanics of fibre reinforced brittle matrices and the implications for cementitious systems. In the second part the authors describe the various types of fibre-cement composites, discussing production processes, mechanical and physical properties, durability and applications. Two new chapters have been added, covering fibre specification and structural applications. *Fibre Reinforced Cementitious Composites* will be of great interest to practitioners involved in modern concrete technology and will also be of use to academics, researchers and graduate students.

Canadian Symposium on Cement and Concrete, 2nd, Vancouver, 24-26 July 1991 University of British Columbia 1991 Sustainability of Concrete Pierre-Claude Aitcin 2011-02-18 Production of Portland cement is responsible for about seven percent of the world's greenhouse gas emissions. The pressure to make the production of concrete more sustainable, or "greener", is considerable and increasing. This requires a wholesale shift in processes, materials and methods in the concrete industry. Pure Portland cement will need to be replaced by more complex binary, tertiary or even quaternary binders, including other types of cementitious materials. We can expect an increasing use of high performance concrete, primarily because of its high sustainability and durability. Much more attention will have to be paid to the proper curing of the concrete if we want to improve its life expectancy. Presenting the latest advances in the science of concrete this book focuses particularly on sustainability, durability, and economy. It explores the potential for increased sustainability in concrete from the initial mixing right through to its behaviour in complex structures exposed to different types of loads and

aggressive environments.

Toughening Mechanisms in Quasi-Brittle Materials S.P. Shah 2012-12-06 A variety of ceramic materials has been recently shown to exhibit nonlinear stress strain behavior. These materials include transformation-toughened zirconia which undergoes a stress-induced crystallographic transformation in the vicinity of a propagating crack, microcracking ceramics, and ceramic-fiber reinforced ceramic matrices. Since many of these materials are under consideration for structural applications, understanding fracture in these quasi-brittle materials is essential. Portland cement concrete is a relatively brittle material. As a result mechanical behavior of concrete, conventionally reinforced concrete, prestressed concrete and fiber reinforced concrete is critically influenced by crack propagation. Crack propagation in concrete is characterized by a fracture process zone, microcracking, and aggregate bridging. Such phenomena give concrete toughening mechanisms, and as a result, the macroscopic response of concrete can be characterized as that of a quasi-brittle material. To design super high performance cement composites, it is essential to understand the complex fracture processes in concrete. A wide range of concern in design involves fracture in rock masses and rock structures. For example, prediction of the extension or initiation of fracture is important in: 1) the design of caverns (such as underground nuclear waste isolation) subjected to earthquake shaking or explosions, 2) the production of geothermal and petroleum energy, and 3) predicting and monitoring earthquakes. Depending upon the grain size and mineralogical composition, rock may also exhibit characteristics of quasi-brittle materials.

Significance of Tests and Properties of Concrete and Concrete-making Materials Joseph F. Lamond 2006

Durability of Concrete Mark Alexander 2017-06-26 This book provides an up-to-date survey of durability issues, with a particular focus on specification and design, and how to achieve durability in actual concrete construction. It is aimed at the practising engineer, but is also a valuable resource for graduate-level programs in universities. Along with background to current philosophies it gathers together in one useful reference a summary of current knowledge on concrete durability, includes information on modern concrete materials, and shows how these materials can be combined to produce durable concrete. The approach is consistent with the increasing focus on sustainability that is being addressed by the concrete industry, with the current emphasis on 'design for durability'.

Concrete Construction Engineering Handbook Edward G. Nawy 2008-06-24 The first edition of this comprehensive work quickly filled the need for an in-depth handbook on concrete construction engineering and technology. Living up to the standard set by its bestselling predecessor, this second edition of the Concrete Construction Engineering Handbook covers the entire range of issues pertaining to the construction

Engineered Concrete Irving Kett 2009-12-23 As every civil engineer knows, Portland Cement is the most versatile and important material of construction, and will probably remain so far into the future. Yet few books, if any, exist that offer an in-depth analysis of the mixing and testing methods of this vital hydraulic cement. This statement, written about the first edition of Engineere

Evaluation of New PCC Maturity Technology 2004

American Book Publishing Record 2005

Fracture and Size Effect in Concrete and Other Quasibrittle Materials Zdenek P. Bazant 2019-03-04 Fracture and Size Effect in Concrete and Other Quasibrittle Materials is the first in-depth text on the application of fracture mechanics to the analysis of failure in concrete structures. The book synthesizes a vast number of recent research results in the literature to provide a comprehensive treatment of the topic that does not give merely the facts - it provides true understanding. The many recent results on quasibrittle fracture and size effect, which were scattered throughout many periodicals, are compiled here in a single volume. This book presents a well-rounded discussion of the theory of size effect and scaling of failure loads in structures. The size effect, which is the most important practical manifestation of fracture behavior, has become a hot topic. It has gained prominence in current research on concrete and quasibrittle materials. The treatment of every subject in Fracture and Size Effect in Concrete and Other Quasibrittle Materials proceeds from simple to complex, from specialized to general, and is as concise as possible using the simplest level of mathematics necessary to treat the subject clearly and accurately. Whether you are an engineering student or a practicing engineer, this book provides you with a clear presentation, including full derivations and examples, from which you can gain real understanding of fracture and size effect in concrete and other quasibrittle materials.

Concrete Sidney Mindess 1981 Concrete text with a materials science orientation. Presents a unified view of concrete behavior in light of underlying chemical and physical principles.

Design of Prestressed Concrete Nilson 1987-04-13

Structural Concrete Salah El-Metwally 2017-10-02 This book examines the application of strut-and-tie models (STM) for the design of structural concrete. It presents state-of-the-art information, from fundamental theories to practical engineering applications, and also provides innovative solutions for many design problems that are not otherwise achievable using the traditional methods.

Waste Materials and By-Products in Concrete Rafat Siddique 2007-11-13 The amount and variety of waste that humanity dumps in landfill sites is nothing short of a scandal, believes Rafat Siddique, of Deemed University in Patiala, India.

Instead, we ought to be building new homes out of it! Siddique shows in this important book that many non-hazardous waste materials and by-products which are landfilled, can in fact be used in making concrete and similar construction materials.

Eleventh International Conference on the Bearing Capacity of Roads, Railways and Airfields Inge Hoff 2021-11-10 Innovations in Road, Railway and Airfield Bearing Capacity - Volume 1 comprises the first part of contributions to the 11th International Conference on Bearing Capacity of Roads, Railways and Airfields (2022). In anticipation of the event, it unveils state-of-the-art information and research on the latest policies, traffic loading measurements, in-situ measurements and condition surveys, functional testing, deflection measurement evaluation, structural performance prediction for pavements and tracks, new construction and rehabilitation design systems, frost affected areas, drainage and environmental effects, reinforcement, traditional and recycled materials, full scale testing and on case histories of road, railways and airfields. This edited work is intended for a global audience of road, railway and airfield engineers, researchers and consultants, as well as building and maintenance companies looking to further upgrade their practices in the field.

Precast Concrete Structures Kim S. Elliott 2019-08-08 This second edition of *Precast Concrete Structures* introduces the conceptual design ideas for the prefabrication of concrete structures and presents a number of worked examples that translate designs from BS 8110 to Eurocode EC2, before going into the detail of the design, manufacture, and construction of precast concrete multi-storey buildings. Detailed structural analysis of precast concrete and its use is provided and some details are presented of recent precast skeletal frames of up to forty storeys. The theory is supported by numerous worked examples to Eurocodes and European Product Standards for precast reinforced and prestressed concrete elements, composite construction, joints and connections and frame stability, together with extensive specifications for precast concrete structures. The book is extensively illustrated with over 500 photographs and line drawings.

Fracture Mechanics of Concrete Surendra P. Shah 1995-09-28 **FRACTURE MECHANICS OF CONCRETE AND ROCK** This book offers engineers a unique opportunity to learn, from internationally recognized leaders in their field, about the latest theoretical advances in fracture mechanics in concrete, reinforced concrete structures, and rock. At the same time, it functions as a superb, graduate-level introduction to fracture mechanics concepts and analytical techniques. Reviews, in depth, the basic theory behind fracture mechanics * Covers the application of fracture mechanics to compression failure, creep, fatigue, torsion, and other advanced topics * Extremely well researched, applies experimental evidence of damage to a wide range of design cases * Supplies all relevant formulas for stress intensity * Covers state-of-the-art linear elastic fracture mechanics (LEFM) techniques for analyzing deformations and cracking * Describes nonlinear fracture mechanics (NLFM) and the latest RILEM modeling techniques for testing nonlinear quasi-brittle materials * And much more Over the past few years, researchers employing techniques borrowed from fracture mechanics have made many groundbreaking discoveries concerning the causes and effects of cracking, damage, and fractures of plain and reinforced concrete structures and rock. This, in turn, has resulted in the further development and refinement of fracture mechanics concepts and tools. Yet, despite the field's growth and the growing conviction that fracture mechanics is indispensable to an understanding of material and structural failure, there continues to be a surprising shortage of textbooks and professional references on the subject. Written by two of the foremost names in the field, *Fracture Mechanics of Concrete* fills that gap. The most comprehensive book ever written on the subject, it consolidates the latest theoretical research from around the world in a single reference that can be used by students and professionals alike. *Fracture Mechanics of Concrete* is divided into two sections. In the first, the authors lay the necessary groundwork with an in-depth review of fundamental principles. In the second section, the authors vividly demonstrate how fracture mechanics has been successfully applied to failures occurring in a wide array of design cases. Key topics covered in these sections include: * State-of-the-art linear elastic fracture mechanics (LEFM) techniques for analyzing deformations and cracking * Nonlinear fracture mechanics (NLFM) and the latest RILEM modeling techniques for testing nonlinear quasi-brittle materials * The use of R-Curves to describe cracking and fracture in quasi-brittle materials * The application of fracture mechanics to compression failure, creep, fatigue, torsion, and other advanced topics The most timely, comprehensive, and authoritative book on the subject currently available, *Fracture Mechanics of Concrete* is both a complete instructional tool for academics and students in structural and geotechnical engineering courses, and an indispensable working resource for practicing engineers.

Concrete Sidney Mindess 2003 This book presents a unified view of concrete behavior in light of a body of chemical and physical principles. It provides the most up-to-date information available on new concrete materials. The most up-to-date information on new concrete materials. SI units used as primary system, keeping readers current to the unit system being adopted in the United States. Latest ASTM specifications are included. Exercises at the end of each chapter. An excellent resource for professionals in this industry.

Multi-Storey Precast Concrete Framed Structures Kim S. Elliott 2013-10-07 Precast reinforced and prestressed concrete frames provide a high strength, stable, durable and robust solution for any multi-storey structure, and are widely regarded as a high quality, economic and architecturally versatile technology for the construction of multi-storey buildings. The resulting buildings satisfy a wide range of commercial and industrial needs. Precast concrete buildings behave in a different way to those where the concrete is cast in-situ, with the components subject to different forces and movements. These factors are explored in detail in this second edition of *Multi-Storey Precast Concrete Framed Structures*, providing a detailed understanding of the procedures involved in precast structural design. This new edition has been fully updated to reflect recent developments, and includes many structural calculations based on EUROCODE standards. These are shown in parallel with similar calculations based on British Standards to ensure the designer is fully aware of the differences required in designing to EUROCODE standards. Civil and structural engineers as well as final year undergraduate and postgraduate students of civil and structural engineering will all find this book to be a thorough overview of this important construction technology.

Advances in Engineering Structures, Mechanics & Construction M. Pandey 2007-02-10 This book presents the proceedings of an International Conference on *Advances in Engineering Structures, Mechanics & Construction*, held in Waterloo, Ontario, Canada, May 14-17, 2006. The contents include the texts of all three plenary presentations and all seventy-three technical papers by more than 153 authors, presenting the latest advances in engineering structures, mechanics and construction research and practice.

Binders for Durable and Sustainable Concrete Pierre-Claude Aïtcin 2007-08-07 Linking theory to practice, this book provides a better fundamental understanding of Portland cement and hydraulic binders which is necessary to make better concrete. It has been clearly demonstrated that concrete durability is closely linked to its water/binder ratio and proper curing during the first week after casting. In this rigorously presented work, Pierre-Claude Aïtcin explains the complexity of the hydration reaction and how to make, use and cure durable and sustainable concrete. This book also details the problems with Portland cement composition at present and outlines the concept of an ideal hydraulic binder which is technically and ecologically efficient, as well as being long-lasting and robust. *Binders for Durable and Sustainable Concrete* is a practical and innovative reference text which will be particularly relevant to engineers and chemists working in the Portland cement, concrete and admixture industries. This book will also be of interest to academics and graduate-level students in Civil Engineering departments who specialize in Portland cement and concrete technology.

Aggregates in Concrete Mark Alexander 2010-02-25 Bringing together in one volume the latest research and information, this book provides a detailed guide to the selection and use of aggregates in concrete. After an introduction defining the purpose and role of aggregates in concrete, the authors present an overview of aggregate sources and production

techniques, followed by a detailed study of their physical, mechanical and chemical properties. This knowledge is then applied to the use of aggregates in both plastic and hardened concretes, and in the overall mix design. Special aggregates and their applications are discussed in detail, as are the current main specifications, standards and tests.

Diffusion of Chloride in Concrete E. Poulsen 2014-04-21 This book is the most comprehensive and flexible theory of chloride ingress in concrete to date. Based on test results and field observations, the book demonstrates the easy application of this theory to practice. The information is presented in a clear style with each chapter containing an introduction, technical applications and examples, and a f

Durability of Concrete Mark G. Alexander 2017 This book provides an up-to-date survey of durability issues, with a particular focus on specification and design, and how to achieve durability in actual concrete construction. It is aimed at the practising engineer, but is also a valuable resource for graduate-level programs in universities. Along with background to current philosophies it gathers together in one useful reference a summary of current knowledge on concrete durability, includes information on modern concrete materials, and shows how these materials can be combined to produce durable concrete. The approach is consistent with the increasing focus on sustainability that is being addressed by the concrete industry, with the current emphasis on 'design for durability'.

Handbook on Nondestructive Testing of Concrete V. M. Malhotra 2004 Written by international experts in the field, this new edition provides the most comprehensive, up-to-date information available on nondestructive testing (NDT) methods used to evaluate concrete structures. Sixteen chapters give you a comprehensive understanding of the tools and techniques used to estimate the in-place strength of concrete and permeation properties that relate to potential durability, and describe methods used to assess the internal condition of concrete and corrosion activity of steel reinforcement.

Materials Science of Concrete, Special Volume Andrew J. Boyd 2002-04-28 This workshop brought together representatives from different areas of the cement and concrete community to discuss future trends and challenges in the field of concrete materials. Topics include developments and their potential for application, industry's view on what it needs from academia, academia's view on what it expects from industry and what they have to offer, technical advances and barriers to advancement, the role of governments, business issues, and ecological and societal barriers.

High Performance Concrete Pierre-Claude Aitcin 1998-07-02 A complete review of the fast-developing topic of high performance concrete (HPC) by one of the leading researchers in the field. It covers all aspects of HPC from materials, properties and technology, to construction and testing. The book will be valuable for all concrete technologists and construction engineers wishing to take advantage of the re

Reinforced Concrete Structures: Analysis and Design David D. E. E. Fanella 2010-12-06 A PRACTICAL GUIDE TO REINFORCED CONCRETE STRUCTURE ANALYSIS AND DESIGN Reinforced Concrete Structures explains the underlying principles of reinforced concrete design and covers the analysis, design, and detailing requirements in the 2008 American Concrete Institute (ACI) Building Code Requirements for Structural Concrete and Commentary and the 2009 International Code Council (ICC) International Building Code (IBC). This authoritative resource discusses reinforced concrete members and provides techniques for sizing the cross section, calculating the required amount of reinforcement, and detailing the reinforcement. Design procedures and flowcharts guide you through code requirements, and worked-out examples demonstrate the proper application of the design provisions. COVERAGE INCLUDES: Mechanics of reinforced concrete Material properties of concrete and reinforcing steel Considerations for analysis and design of reinforced concrete structures Requirements for strength and serviceability Principles of the strength design method Design and detailing requirements for beams, one-way slabs, two-way slabs, columns, walls, and foundations

Design and Control of Concrete Mixtures Portland Cement Association 2018-10-12 This work has been selected by scholars as being culturally important and is part of the knowledge base of civilization as we know it. This work is in the public domain in the United States of America, and possibly other nations. Within the United States, you may freely copy and distribute this work, as no entity (individual or corporate) has a copyright on the body of the work. Scholars believe, and we concur, that this work is important enough to be preserved, reproduced, and made generally available to the public. To ensure a quality reading experience, this work has been proofread and republished using a format that seamlessly blends the original graphical elements with text in an easy-to-read typeface. We appreciate your support of the preservation process, and thank you for being an important part of keeping this knowledge alive and relevant.

Standard Practice for Concrete United States. Army. Corps of Engineers 1974

The Alkali-Silica Reaction in Concrete R N Swamy 1991-09-01 This book reviews the fundamental causes and spectrum effects of ASR. It considers the advances that have been made in our understanding of this problem throughout the world.

Advanced Concrete Technology Zongjin Li 2011-01-11 Over the past two decades concrete has enjoyed a renewed level of research and testing, resulting in the development of many new types of concrete. Through the use of various additives, production techniques and chemical processes, there is now a great degree of control over the properties of specific concretes for a wide range of applications. New theories, models and testing techniques have also been developed to push the envelope of concrete as a building material. There is no current textbook which brings all of these advancements together in a single volume. This book aims to bridge the gap between the traditional concrete technologies and the emerging state-of-the-art technologies which are gaining wider use.

Reinforced Concrete James Grierson MacGregor 1997 Based on the 1995 edition of the American Concrete Institute Building Code, this text explains the theory and practice of reinforced concrete design in a systematic and clear fashion, with an abundance of step-by-step worked examples, illustrations, and photographs. The focus is on preparing students to make the many judgment decisions required in reinforced concrete design, and reflects the author's experience as both a teacher of reinforced concrete design and as a member of various code committees. This edition provides new, revised and expanded coverage of the following topics: core testing and durability; shrinkage and creep; bases the maximum steel ratio and the value of the factor on Appendix B of ACI318-95; composite concrete beams; strut-and-tie models; dapped ends and T-beam flanges. It also expands the discussion of STMs and adds new examples in SI units.

Electricity Retail Wheeling Handbook John M. Studebaker 2001 This reference book provides a straightforward information resource for the electricity purchaser on how to successfully utilize retail wheeling. Covered in detail are the steps by which the retail wheeling process is implemented, as well as what role agents, marketers and brokers play.

Transmission and Distribution Electrical Engineering Colin R. Bayliss 2012 Chapter 1: System Studies -- Chapter 2:

Drawings and Diagrams -- Chapter 3: Substation Layouts -- Chapter 4: Substation Auxiliary Power Supplies -- Chapter 5: Current and Voltage Transformers -- Chapter 6: Insulators -- Chapter 7: Substation Building Services -- Chapter 8: Earthing and Bonding -- Chapter 9: Insulation Co-ordination -- Chapter 10: Relay Protection -- Chapter 11: Fuses and Miniature Circuit Breakers -- Chapter 12: Cables -- Chapter 13: Switchgear -- Chapter 14: Power Transformers -- Chapter 15: Substation and Overhead Line Foundations -- Chapter 16: Overhead Line Routing -- Chapter 17: Structures, Towers and Poles -- Chapter 18: Overhead Line Conductor and Technical Specifications -- Chapter 19: Testing and Commissioning -- Chapter 20: Electromagnetic Compatibility -- Chapter 21: Supervisory Control and Data Acquisition -- Chapter 22: Project Management -- Chapter 23: Distribution Planning -- Chapter 24: Power Quality- Harmonics in Power Systems -- Chapter 25: Power Qual ...

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