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Sustainable Construction and Building Materials Bibhuti Bhusan Das 2018-12-30 This book presents select proceedings of the International Conference on Sustainable Construction and Building Materials (ICSCBM 2018), and examines a range of durable, energy-efficient, and next-generation construction and building materials produced from industrial wastes and byproducts. The topics covered include alternative, eco-friendly construction and building materials, next-generation concretes, energy efficiency in construction, and sustainability in construction project management. The book also discusses various properties and performance attributes of modern-age concretes including their durability, workability, and carbon footprint. As such, it offers a valuable reference for beginners, researchers, and professionals interested in sustainable construction and allied fields.

Computational Modelling of Concrete Structures Gunther Meschke 2006-03-16 This conference proceedings brings together the work of researchers and practising engineers concerned with computational modelling of complex concrete, reinforced concrete and prestressed concrete structures in engineering practice. The subjects considered include computational mechanics of concrete and other cementitious materials, including masonry. Advanced discretisation methods and microstructural aspects within multi-field and multi-scale settings are discussed, as well as modelling formulations and constitutive modelling frameworks and novel experimental programmes. The conference also considered the need for reliable, high-quality analysis and design of concrete structures in regard to safety-critical structures, with a view to adopting these in codes of practice or recommendations. The book is of special interest to researchers in computational mechanics, and industry experts in complex nonlinear simulations of concrete structures.

Concrete Solutions 2011 Michael Grantham 2011-09-08 The Concrete Solutions series of International Conferences on Concrete Repair began in 2003, with a conference held in St. Malo, France in association with INSA Rennes, followed by the second conference in 2006 (with INSA again, at St. Malo, France), and the third conference in 2009 (in Padova and Venice, in association with the University of Padova). Now in 2011, the event is being held in Dresden in Germany and has brought together some 112 papers from 33 countries. Whereas electrochemical repair tended to dominate the papers in earlier years, new developments in structural strengthening with composites have been an increasingly important topic, with a quarter of the papers now focusing on this area. New techniques involving Near Surface Mounted (NSM) carbon fibre rods, strain hardening composites, and new techniques involving the well established carbon fibre and polyimide wrapping and strengthening systems are presented. Seventeen papers concentrate on case studies which are all-important in such conferences, to learn about what works (and what doesn't work) on real structures. Thirteen papers are devoted to new developments in Non-Destructive Testing (NDT). Other topics include service life modelling, fire damage, surface protection methods and coatings, patch repair, general repair techniques and whole life costing. This book is essential reading for anyone engaged in the concrete repair field, from engineers, to academics and students and also to clients, who, as the end user, are ultimately responsible for funding these projects and making those difficult decisions about which system or method to use.

Advances in Construction Management Lee Yee Loon 2022 This book presents the select proceedings of the International Conference on Advances in Construction Materials and Management (ACMM 2021). It discusses the recent innovations towards construction management, building technology and new materials in practice in civil engineering. Various topics covered include architecture and urban planning, smart materials and structures, GIS in construction application, transportation materials and engineering, geotechnical applications in construction, energy and sustainability, green building technologies and materials and construction management. The book will be useful for beginners, researchers and professionals working in the area of civil engineering. .

New Achievements in Continuum Mechanics and Thermodynamics Bilen Emek Abali 2019-03-13 This book presents a liber amicorum dedicated to Wolfgang H. Müller, and highlights recent advances in Prof. Müller's major fields of research: continuum mechanics, generalized mechanics, thermodynamics, mechanochemistry, and geomechanics. Over 50 of Prof. Müller's friends and colleagues contributed to this book, which commemorates his 60th birthday and was published in recognition of his outstanding contributions.

Creep and Hygrothermal Effects in Concrete Structures Zdeněk P. Bažant 2018-01-17 This comprehensive treatise covers in detail practical methods of analysis as well as advanced mathematical models for structures highly sensitive to creep and shrinkage. Effective computational algorithms for century-long creep effects in structures, moisture diffusion and high temperature effects are presented. The main design codes and recommendations (including RILEM B3 and B4) are critically compared. Statistical uncertainty of century-long predictions is analyzed and its reduction by extrapolation is discussed, with emphasis on updating based on short-time tests and on long-term measurements on existing structures. Testing methods and the statistics of large randomly collected databases are critically appraised and improvements of predictions of multi-decade relaxation of prestressing steel, cyclic creep in bridges, cracking damage, etc., are demonstrated. Important research directions, such as nanomechanical and probabilistic modeling, are identified, and the need for separating the long-lasting autogenous shrinkage of modern concretes from the creep and drying shrinkage data and introducing it into practical prediction models is emphasized. All the results are derived mathematically and justified as much as possible by extensive test data. The theoretical background in linear viscoelasticity with aging is covered in detail. The didactic style makes the book suitable as a textbook. Everything is properly explained, step by step, with a wealth of application examples as well as simple illustrations of the basic phenomena which could alternate as homeworks or exams. The book is of interest to practicing engineers, researchers, educators and graduate students.

International Journal of Engineering Research in Africa Trans Tech Publications, Limited 2018-06-01 We present to our readers the 36th volume of the International Journal of Engineering Research in Africa. This volume contains articles describing the results of engineering research and technical solutions in the fields of the applied mechanics, research

of materials and processing technologies in the mechanical engineering, construction materials, optimization of reactive power dispatch, technological processes in the chemical and food production, environmental engineering and engineering management. The articles will be useful for the professionals concerned with mechanical engineering, materials science, chemical engineering, power production and engineering management as well as for academic teachers and students majoring in these fields of engineering science.

Sustainable Materials and Smart Practices M. Vasudevan 2022-06-15 This book presents recent research on sustainable building materials and their various applications. Topics include such items as fiber reinforced concrete, the use of mineral admixtures. self-sensing cement composites, the use of nanomaterials for structural health monitoring and the production of geopolymer mortar. Keywords: Light Transmitting Concrete, Self-Compacting Concrete, Light-Weight Concrete, Polymer Concrete, Porous Concrete, Eco-Friendly Building Material, Cement Composite, Geopolymer Composites, Sustainable Bricks, Cement, Sisal Fiber, Glass Fiber, Nanomaterials, Metakaoline, Fly Ash, Silica Fume, Rice Husk Ash, Oyster Shells, Bitumen, Sugarcane Bagasse Ash, Herbocrete, Waste Foundry Sand, Swell Pressure of Clay, Quarry Dust, Sensors, Topology Optimization, Soil Stabilization.

Geopolymers as Sustainable Surface Concrete Repair Materials Ghasan Fahim Huseien 2022-08-11 The progressive deterioration of concrete surface structures is a major concern in construction engineering that requires precise repairing. While a number of repair materials have been developed, geopolymer mortars have been identified as potentially superior and environmentally friendly high-performance construction materials, as they are synthesized by selectively combining waste materials containing alumina and silica compounds which are further activated by a strong alkaline solution. Geopolymers as Sustainable Surface Concrete Repair Materials offers readers insights into the synthesis, properties, benefits and applications of geopolymer-based materials for concrete repair. • Discusses manufacturing and design methods of geopolymer-based materials • Assesses mechanical strength and durability of geopolymer-based materials under different aggressive environmental conditions • Characterizes the microstructure of these materials using XRD, SEM, EDX, TGA, DTG and FTIR measurements • Describes application of geopolymer-based materials as surface repair materials • Compares environmental and cost benefits against those of traditional OPC and commercial repair materials This book is written for researchers and professional engineers working with concrete materials, including civil and materials engineers.

Recent Advancements in Geotechnical Engineering B. Soundara 2021-10-15 Geotechnical engineering has become an important discipline of civil engineering due to its rapid advancements and environmental challenges. Special emphasis is placed on innovative materials in the fields of geotechnical engineering, pavement engineering, health monitoring of structures and sustainability. Keywords: Green Building Materials, Cement Based Materials, Concrete Applications, Photocatalytic Effect on Paver Blocks, Stabilization of Black Cotton Soil, Concrete Filled Steel Tube Columns, Cenosphere, Fly Ash Brick, Stone Columns, Reinforced Concrete Beams, Interlocking Masonry Units, Lightweight Filler Materials, Soil Stabilization Using Fibres, Friction Stir Welding of Aluminum and Magnesium.

Waste Materials in Advanced Sustainable Concrete Md Rezaur Rahman

Computational Methods for Reinforced Concrete Structures Ulrich Häußler-Combe 2014-11-24 The book covers the application of numerical methods to reinforced concrete structures. To analyze reinforced concrete structures linear elastic theories are inadequate because of cracking, bond and the nonlinear and time dependent behavior of both concrete and reinforcement. These effects have to be considered for a realistic assessment of the behavior of reinforced concrete structures with respect to ultimate limit states and serviceability limit states. The book gives a compact review of finite element and other numerical methods. The key to these methods is through a proper description of material behavior. Thus, the book summarizes the essential material properties of concrete and reinforcement and their interaction through bond. These basics are applied to different structural types such as bars, beams, strut and tie models, plates, slabs and shells. This includes prestressing of structures, cracking, nonlinear stress-strain relations, creeping, shrinkage and temperature changes. Appropriate methods are developed for each structural type. Large displacement and dynamic problems are treated as well as short-term quasi-static problems and long-term transient problems like creep and shrinkage. Most problems are illustrated by examples which are solved by the program package ConFem, based on the freely available Python programming language. The ConFem source code together with the problem data is available under open source rules at concrete-fem.com. The author aims to demonstrate the potential and the limitations of numerical methods for simulation of reinforced concrete structures, addressing students, teachers, researchers and designing and checking engineers.

Brittle Matrix Composites 7 A M Brandt 2003-10-15 The International Symposium in Brittle Matrix Composites October 13-15, 2003 covers a wide spectrum of topics including cement based composites, ceramic composites and brittle polymer matrix composites. In the papers various topics and issues are considered such as: analytical and numerical studies related to the design of composites, prediction of behaviour and verification of strength and stability, testing methods, manufacturing processes and repair, environmental effects and durability assessment. The present volume of 55 papers proves that there are still many problems in the field of brittle matrix composites deserving theoretical and experimental investigations and that new solutions to these problems are needed for practical application in civil engineering, industrial structures, machinery and other domains.

Advances in Construction Materials and Sustainable Environment Ashok Kumar Gupta

fib Model Code for Concrete Structures 2010 fib - federation internationale du beton 2013-12-04

Compressive Strength of Concrete Pavel Krivenko 2020-03-11 Concrete made using mineral cements, the raw materials which on earth are practically endless, is known as one of the oldest building materials and during the last decades of the twentieth century has become a dominant building material for general use. At the same time, the requirements of the quality of concrete and its performance properties, in particular compressive strength, durability, economical

efficiency, and low negative impact of its manufacture on the environment have not yet been completely met. Bearing these requirements in mind, researchers and engineers worldwide are working on how to satisfy these requirements. This book has been written by researchers and experts in the field and provides the state of the art on recent progress achieved on the properties of concrete, including concrete in which industrial by-products are utilized. The book is dedicated to graduate students, researchers, and practicing engineers in related fields.

Concrete International 1993

Concrete International 1998

Applications of Fracture Mechanics to Reinforced Concrete Alberto Carpinteri 2018-10-08 This volume emphasizes the most recent advances in fracture mechanics as specifically applied to steel bar reinforced concrete. Fracture mechanics has been applied to plain and fibre reinforced concrete with increasing success over recent years. This workshop extended these concepts to steel bar reinforced and pre-stressed concrete design. Particularly for high strength concrete, which is a very brittle material, and in the case of large structural members, the application of fracture mechanics appears to be very useful for improving the present design rules. The pre-eminent participants at the Turin workshop contributed extensive expert opinions in four selected areas for which a rational approach, using fracture mechanics, could introduce variations into the concrete design codes: size effects; anchorage and bond; minimum reinforcement for elements in flexure; and shear resistance. The 23 chapters logically address these themes and demonstrate the unique ability of fracture mechanics to capture all the experimentally observed characteristics. The book is primarily directed to the researchers in universities and institutions and will be of value to consultants and engineering companies.

Unique Polymeric Fiber and Fiber Delivery Systems for the Economic Preparation of High-fiber Content Concrete with Superior Physical Properties Billy D. Neeley 1998 This report documents the results from an investigation of a new polymer fiber and unique delivery system for charging fibers into concrete mixtures. The straight Polyolefin fibers are available in two sizes: (1) 0.63 mm in diameter and 50 mm long, and (2) 0.38 mm in diameter and 25 mm long. Each of the two sizes of fibers is packaged in bundles approximately 50 mm in diameter. Each bundle is encased with paper tape bound with a water-soluble glue. The fibers are charged into the concrete mixture in mass. Approximately 3 to 10 min of mixing time is necessary to uniformly distribute the fibers throughout the concrete mixture, depending upon the fiber content, consistency of the concrete mixture, and the type of mixer being used. Fresh and hardened properties were evaluated in mixtures containing up to 15 kg/cu m. The results indicate that concrete mixtures with the Polyolefin fibers can be produced having adequate workability and finishability if proportioned properly. Addition of the Polyolefin fibers does not significantly influence the compressive nor first-crack flexural strength, freezing-and-thawing resistance, drying shrinkage, nor the chloride permeability of concrete mixtures. However, the presence of the Polyolefin fibers does influence the post-crack behavior of concrete mixtures. Impact resistance and flexural toughness are improved as the fiber loading increases. A 6,100-m whitetopping demonstration project was constructed on a heavily traveled interstate in Mississippi. The whitetopping was 100 mm thick. Details of the specifications, construction, and early-time performance are given.

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

Advances in Protective Structures Research Hong Hao 2012-08-17 The International Association of Protective Structures (IAPS) was launched on 1 October 2010 in Manchester, UK during the first International Conference of Protective Structures. The primary purpose of IAPS is to bring researchers and engineers working in the area of protective structures together, and to promote research and development work for better life and structure protection against shock and impact loads. More information can be found at <http://www.protectivestructures.org/contact.html>. Advances in Protective Structures Research is the first publication in a series of planned publications by IAPS. It contains 13 chapters prepared by active and prominent researchers around the world in the area of protective structures. It covers the dynamic material model and material properties, structural response analysis, structural reliability analysis, impact loads and ground shock. The contents of the book reflect well the current research achievements and practice in structural protection against blast and impact loads. They represent the advanced international research status in theoretical derivations, numerical simulations, and laboratory and field tests for structure protections.

Fracture Scaling Zdenek P. Bazant 2012-12-06 This volume is a collection of the papers given at the workshop on Fracture Scaling, held at the University of Maryland, USA, 10-12 June 1999, under the sponsorship of the Office of Naval Research, Arlington, VA, USA. These papers can be grouped under five major themes: Micromechanical analysis Size effects in fiber composites Scaling and heterogeneity Computational aspects and nonlocal or gradient models Size effects in concrete, ice and soils . This workshop is the result of a significant research effort, supported by the Office of Naval Research, into the problems of scaling of fracture in fiber composites, and generally into the problems of scaling in solid mechanics. These problems, which are of interest for many materials, especially all quasibrittle materials, share similar characteristics. Thus, progress in the understanding of scaling problems for one material may help progress for another material. This makes it clear that a dialogue between researchers in various fields of mechanics is highly desirable and should be promoted. In view of this, this volume should be of interest to researchers and advanced graduate students in materials science, solid mechanics and civil engineering.

Mine Waste Utilization Ram Chandar Karra 2022-06-16 This book is a comprehensive work on utilization of overburden waste, ash, tailings, and other processed waste produced by mining industry. It details various laboratory tests to identify the suitability of mine waste. It explains varied usage of different types of mine waste as in concrete pavements, bricks and to enhance fertile characteristics of waste lands. Various physico-mechanical properties of mine waste material and their optimum percentage for replacement with sand and coarse aggregate along with additives for optimum strength of concrete / bricks are discussed. Key features: Covers the technical approach in terms of testing and characterizing mine waste Focusses on effective use of mining waste to make sustainable and ecofriendly mining Presents analysis of physical properties of iron ore waste and their usage Describes testing methods for each type of mine waste and its physical property characterization for every application Includes detailed study to use iron ore waste and tailings in concrete pavements This book is aimed at researchers, professionals and graduate students in mining, geotechnical, and civil engineering.

Concrete for the Modern Age Developments in materials and processes Dr Atef Badr 2017 This volume presents a wide-ranging review of the latest developments in concrete technology that have been largely missing from the global conference circuit. It the first major international event under the auspices of the Institute of Concrete Technology

(ICT) and is appropriately located in the Middle East at the heart of a construction boom. Themes covered include admixture technology, durability, mix design, special cements and supplementary materials, reinforced concrete and sustainability. The 39 papers provide interesting theory and applicable practice blended with research findings – from the application of 3D printing to performance-based specifications and the role of concrete in the development of Oman – to produce a volume of value to many engineers and technologists. Founded in 1972, The Institute of Concrete Technology (ICT)'s mission is to preserve and promote concrete technology as a recognised engineering discipline and consolidate the professional status of practising concrete technologists worldwide. It is the concrete sector's professional development body, operating internationally, with some 500 members in more than 30 countries. It is an awarding body for qualifications in concrete technology and a facilitator of continuing professional development (CPD) and networking opportunities. Our partner in this conference, The Military Technical College in Muscat, Oman, was established with the intent of becoming a Center of Excellence in engineering education. Located in one purpose-built, state-of-the-art, well-resourced center, the intent is that MTC will be amongst the world's best in the field of military and applied non-military technological education and training providers in the world.

Critical Energy Infrastructure Protection L. Kruszka 2022-05-17 Damage to critical energy infrastructure as a result of terrorism, criminal activity or natural disaster can have a significant impact at both a national and international level. Reducing the vulnerability of critical infrastructure to protect populations is therefore a high priority for governments worldwide, and high-quality training courses and advanced technologies are imperative in this regard. This book presents edited contributions from the NATO Advanced Training Course (ATC) entitled 'Critical Energy Infrastructure Protection: Innovative Structures and Materials for Blast and Ballistic Protection', held as a virtual event from 22 - 25 March 2021. The principal aim of the course was to gather specialists from NATO member and partner countries interested in protecting their critical infrastructure against terrorist attacks, and to share research and practical experience in this field. The meeting provided a forum for participants and speakers to disseminate their recent work, and also served to promote the exchange of ideas and international cooperation among scientists and engineers. The focus was on the physical protection of critical infrastructure in the face of certain types of intentional threat or accident, such as explosions, impacts and blast waves, and the experts shared their experience on topics including the mitigation of risks, classification of vulnerabilities, improvement of resilience, advanced protective materials, dynamic testing of materials and structures, simulations, and numerical prediction methods. The book will be of interest to all those whose work involves protecting critical infrastructure from the threat of terrorist attacks.

Structural Investigation for Reinforcing Congestion Alleviation in Concrete Members and Connections Yu Huang 2014-01-03 In this book, three potential solutions to the issue of steel congestion in reinforced concrete (RC) structures are researched. The first method examines RC mixed with steel fibers. The use of steel fibers instead of stirrups results in the reduction of reinforcing congestion in a manner which is both effective in reducing the effects of congestion and practical to implement. In the second method, reinforcing congestion in RC or prestressed concrete (PC) structures is effectively reduced by t ...

Continuous and Discontinuous Modelling of Fracture in Concrete Using FEM Jacek Tejchman 2012-07-28 The book analyzes a quasi-static fracture process in concrete and reinforced concrete by means of constitutive models formulated within continuum mechanics. A continuous and discontinuous modelling approach was used. Using a continuous approach, numerical analyses were performed using a finite element method and four different enhanced continuum models: isotropic elasto-plastic, isotropic damage and anisotropic smeared crack one. The models were equipped with a characteristic length of micro-structure by means of a non-local and a second-gradient theory. So they could properly describe the formation of localized zones with a certain thickness and spacing and a related deterministic size effect. Using a discontinuous FE approach, numerical results of cracks using a cohesive crack model and XFEM were presented which were also properly regularized. Finite element analyses were performed with concrete elements under monotonic uniaxial compression, uniaxial tension, bending and shear-extension. Concrete beams under cyclic loading were also simulated using a coupled elasto-plastic-damage approach. Numerical simulations were performed at macro- and meso-level of concrete. A stochastic and deterministic size effect was carefully investigated. In the case of reinforced concrete specimens, FE calculations were carried out with bars, slender and short beams, columns, corbels and tanks. Tensile and shear failure mechanisms were studied. Numerical results were compared with results from corresponding own and known in the scientific literature laboratory and full-scale tests.

Magazine of Concrete Research 1990

Computational Modelling of Concrete Structures Nenad Bicanic 2010-02-24 Since 1984 the EURO-C conference series (Split 1984, Zell am See 1990, Innsbruck 1994, Badgastein 1998, St Johann im Pongau 2003, Mayrhofen 2006, Schladming 2010) has provided a forum for academic discussion of the latest theoretical, algorithmic and modelling developments associated with computational simulations of concrete and concrete structure

Interfacial Transition Zone in Concrete J.C. Maso 2004-03-01 An important new state-of-the-art report prepared by RILEM Technical Committee 108 ICC. It has been written by a team of leading international experts from the UK, USA, Canada, Israel, Germany, Denmark, South Africa, Italy and France. Research studies over recent years in the field of cement science have focused on the behaviour of the interfaces between the components of cement-based materials. The techniques used in other areas of materials science are being applied to the complex materials found in cements and concretes, and this book provides a significant survey of the present state of the art.

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 this 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.

Numerical Modeling of Concrete Cracking Guenter Hofstetter 2011-10-08 The book presents the underlying theories of the different approaches for modeling cracking of concrete and provides a critical survey of the state-of-the-art in computational concrete mechanics. It covers a broad spectrum of topics related to modeling of cracks, including continuum-based and discrete crack models, meso-scale models, advanced discretization strategies to capture evolving cracks based on the concept of finite elements with embedded discontinuities and on the extended finite element method, and extensions to coupled problems such as hygro-mechanical problems as required in computational durability analyses of concrete structures.

Advances in Applied Mechanics 2010-11-03 The *Advances in Applied Mechanics* book series draws together recent significant advances in various topics in applied mechanics. Published since 1948, *Advances in Applied Mechanics* aims to provide authoritative review articles on topics in the mechanical sciences, primarily of interest to scientists and engineers working in the various branches of mechanics. This content is also relevant to the many who use the results of investigations in mechanics in various application areas, such as aerospace, chemical, civil, environmental, mechanical and nuclear engineering. Covers all fields of the mechanical sciences. Highlights classical and modern areas of mechanics that are prime for review. Provides comprehensive coverage of applied mechanics for scientists and engineers as well as those in various application areas.

Crack Analysis in Structural Concrete Zihai Shi 2009-06-17 This new book on the fracture mechanics of concrete focuses on the latest developments in computational theories, and how to apply those theories to solve real engineering problems. Zihai Shi uses his extensive research experience to present a detailed examination of multiple-crack analysis and mixed-mode fracture. Compared with other mature engineering disciplines, fracture mechanics of concrete is still a developing field with extensive new research and development. In recent years many different models and applications have been proposed for crack analysis; the author assesses these in turn, identifying their limitations and offering a detailed treatment of those which have been proved to be robust by comprehensive use. After introducing stress singularity in numerical modelling and some basic modelling techniques, the Extended Fictitious Crack Model (EFCM) for multiple-crack analysis is explained with numerical application examples. This theoretical model is then applied to

study two important issues in fracture mechanics - crack interaction and localization, and fracture modes and maximum loads. The EFCM is then reformulated to include the shear transfer mechanism on crack surfaces and the method is used to study experimental problems. With a carefully balanced mixture of theory, experiment and application, *Crack Analysis in Structural Concrete* is an important contribution to this fast-developing field of structural analysis in concrete. Latest theoretical models analysed and tested. Detailed assessment of multiple crack analysis and multi-mode fractures. Applications designed for solving real-life engineering problems.

International Journal for Housing Science and Its Applications 1991

Specifications for Structural Concrete, ACI 301-05, with Selected ACI References 2005

The Sustainable City XII C.A. Brebbia 2017-12-20 Grouping a selection of papers from the 12th International Conference on Urban Regeneration and Sustainability, this book refers to all aspects of urban environment and provides solutions that lead towards sustainability. The series maintains its strong reputation and a substantial number of contributions have been made from a diverse range of transnational delegates, resulting in a variety of topics and experiences. Urban areas face a number of challenges related to reducing pollution, improving main transportation and infrastructure systems and these challenges can contribute to the development of social and economic imbalances and require the development of new solutions. The challenge is to manage human activities, pursuing welfare and prosperity in the urban environment, whilst considering the relationships between the parts and their connections with the living world. The dynamics of its networks (flows of energy matter, people, goods, information and other resources) are fundamental for an understanding of the evolving nature of today's cities. Large cities represent a productive ground for architects, engineers, city planners, social and political scientists able to conceive new ideas and time them according to technological advances and human requirements. The multidisciplinary components of urban planning, the challenges presented by the increasing size of cities, the amount of resources required and the complexity of modern society are all addressed. The published papers cover the following fields: Urban strategies; Planning, development and management; The community and the city; Infrastructure and society; Eco-town planning; Spatial conflicts in the city; Urban transportation and planning; Conservation and regeneration; Architectural issues; Sustainable energy and the city; Environmental management; Flood risk; Waste management; Urban air pollution; Health issues; Water resources; Landscape planning and design; Intelligent environment; Planning for risk and natural hazards; Waterfront development; Case studies.

Rock Fragmentation by Blasting Pradeep K. Singh 2012-11-05 *Rock Fragmentation by Blasting* contains the papers presented at the 10th International Symposium on Rock Fragmentation by Blasting (New Delhi, India, 26-29 November 2012), and represents the most advanced forum on blasting science and technology. The contributions cover all major recent advancements in blasting and fragmentation, from realistic tre

Resilient Infrastructure Sreevalsa Kolathayar 2021-10-28 This book presents the select proceedings of the Virtual Conference on Disaster Risk Reduction (VCDRR 2021). This book discusses various relevant topics such as Disaster resilience and Infrastructure, Risk reduction and structural measures, Evidence based approach for DRR Case studies, Numerical modelling and Constructions methods, Prevention Methods and Safety Engineering, Cross cutting issue in DRR and Infrastructure etc. The book is also a comprehensive volume on multi-hazards and their management for a sustainable built environment. This book will be useful for academicians, research scholars and industry professionals working in the area of civil engineering and disaster management.