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MELINA LEBLANC

Civil Engineering and Urban Planning III Springer Science & Business Media

A summary on developments in construction, design and the innovation in concrete technology. It describes a number of building studies where speed of construction, cost savings and early completion were a priority, and it highlights the outcome of some pioneering research on concrete technology.

High Strength Concrete Birkhäuser

Can an outdated or failed solution in one industry bring disruption to another? Can a racing team improve industrial manufacturing productivity? Can science fiction offer entrepreneurs valuable lessons in innovative thinking? Such examples lie at the core of exprovement, which is an exponential improvement borne out of drawing parallels between the seemingly unrelated. Henry Ford revolutionized the automotive industry by comparing and correlating his business with the meat-packing industry. Through the various examples highlighted in this book, Hersh Haladker and Raghunath Mashekar emphasize that searching for growth opportunities within an offering's existing industry usually results in incremental improvement, whereas exponential improvement can be achieved by drawing parallels from outside of the current context. This book will inspire leaders to look

outward for parallels, keeping in mind that 'obvious' comparisons can at best lead to improvement, whereas 'unexpected' ones can lead to exponential improvement and perpetuate a legacy of innovation.

Ferrocement Taylor & Francis

This volume contains the proceedings of the 12th International Conference on Geosynthetics (12 ICG), held in Roma, Italy, 17-21 September 2023. About 750 Authors - Academics, Researchers, Students, Practitioners, Contractors and Manufacturers - contributed to the peer-reviewed papers of this volume, which includes the Giroud lecture, the Bathurst lecture, the Rowe lecture, four keynote lectures and 296 technical papers. The content of these proceedings illustrates the sustainable use of geosynthetics in a variety of innovative as well as consolidated applications. After the sustainability implications in the correct use of geosynthetics, the ability to overcome the natural events effects, often related to the climate change, and to adequately afford the human activities (as the increase of pollution) forced to refer to a new keyword: Resiliency. The 12 ICG intends to become the base for the next step, hence the conference theme is 'Geosynthetics, Leading the Way to a Resilient Planet'. The conference topics, through general and parallel sessions, invited presentations and keynote lectures, address the most recent developments in geosynthetic engineering, and stimulate fruitful technical and scientific interaction among academicians, professionals, manufacturers, students. The 12 ICG proceedings contain a wealth of information that could be useful for researchers, practitioners and all those working in the broad, innovative and dynamic field of geosynthetics.

Construction Manual: Concrete & Formwork Springer Nature

Among all building materials, concrete is the most commonly used—and there is a staggering demand for it. However, as we strive to build taller structures with improved seismic resistance or durable pavement with an indefinite service life, we require materials with better performance than the conventional materials used today. Considering the enormous investment in public infrastructure and society's need to sustain it, the need for new and innovative materials for the repair and rehabilitation of civil infrastructure becomes more evident. These improved properties may be defined in terms of carbon footprint, life-cycle cost, durability, corrosion resistance, strength, ductility, and stiffness. Addressing recent trends and future directions, *Mechanics of Fiber and Textile Reinforced Cement Composites* presents new opportunities for developing innovative and cost-effective materials and techniques in cement and concrete composites manufacturing, testing, and design. The book offers mathematical models, experimental results, and computational algorithms for efficient designs with fiber and textile reinforced composite systems. It explores alternative solutions using blended cements, innovative reinforcing systems, natural fibers, experimental characterization of key parameters used for design, and optimized designs. Each chapter begins with a detailed introduction, supplies a thorough overview of the existing literature, and sets forth the reasoning behind the experimentation and theory. Documenting the composite action of fibers and textiles, the book develops and explains methods for manufacturing and testing cement composites. Methods to design and analyze structures for reduced weight, increased durability, and minimization of cement use are also examined. The book demonstrates that using a higher volume fraction of fiber systems can result in composites that are quasi-elastic plastic. Speaking to the need to optimize structural performance and sustainability in construction, this comprehensive and cohesive reference requires readers to rethink the traditional design and manufacturing of reinforced concrete structures.

Geosynthetics: Leading the Way to a Resilient Planet Springer Nature

Although the disciplines of architecture and structural engineering have both experienced their own historical development, their interaction has resulted in many fascinating and delightful structures. To take this interaction to a higher level, there is a need to stimulate the inventive and creative design of architectural structures and to persuade architects and structural engineers to further collaborate in this process, exploiting together new concepts, applications and challenges. This set of book of abstracts and full paper searchable CD-ROM presents selected papers presented at the 3rd International Conference on Structures and Architecture Conference (ICSA2016), organized by the School of Architecture of the University of Minho, Guimarães, Portugal (July 2016), to promote the synergy in the collaboration between the disciplines of architecture and structural engineering. The set addresses all major aspects of structures and architecture, including building envelopes, comprehension of complex forms, computer and experimental methods, concrete and masonry structures, educating architects and structural engineers, emerging technologies, glass structures, innovative architectural and structural design, lightweight and membrane structures, special structures, steel and composite structures, the borderline between architecture and structural engineering, the history of the relationship between architects and structural engineers, the tectonics of architectural solutions, the use of new materials, timber structures and more. The contributions on creative and scientific aspects of the conception and construction of structures, on advanced technologies and on complex architectural and structural applications represent a fine blend of scientific, technical and practical novelties in both fields. This set is intended for both researchers and practitioners, including architects, structural and construction engineers, builders and building consultants, constructors, material suppliers and product manufacturers, and other experts and professionals involved in the design and realization of architectural, structural and infrastructural projects.

Exprovement FIB - Féd. Int. du Béton

Development of Ultra-High Performance Concrete against Blasts: From Materials to Structures presents a detailed overview of UHPC development and its related applications in an era of rising terrorism around the world. Chapters present case studies on the novel development of the new generation of UHPC with nano additives. Field blast test results on reinforced concrete columns made with UHPC and UHPC filled double-skin tubes columns are also presented and compiled, as is the residual load-carrying capacities of blast-damaged structural members and the exceptional performance of novel UHPC materials that illustrate its potential in protective structural design. As a notable representative, ultra-high performance concrete (UHPC) has now been widely investigated by government agencies and universities. UHPC inherits many positive aspects of ultra-high strength concrete (UHSC) and is equipped with improved ductility as a result of fiber addition. These features make it an ideal construction material for bridge decks, storage halls, thin-wall shell structures, and other infrastructure because of its protective properties against seismic, impact and blast loads. Focuses on the principles behind UHPC production, properties, design and detailing aspects Presents a series of case studies and filed blast tests on columns and slabs Focuses on applications and future developments

Proceedings of the Vermont Society of Engineers ... CRC Press

This work discusses the variations that occur in the strength of concrete and presents numerical methods useful in interpreting these variations.

Individual chapters include the relationship between composition and strength of concrete.

Concrete-cement Age CRC Press

This book on flexible formwork for fluid architecture is a multi-faceted research that covers a broad field: from design to material and technology, and from history to future developments. It offers a pragmatic approach that can be extended with more cases, materials, techniques and methods for fluid architecture, and provides a better understanding of the main aspects of fluid architecture and to help them find the most suitable combinations of all aspects. The book is a challenging experience with many new discoveries, including two patents: one on moulding of fluid surfaces and one on 3D printing of fibre-reinforced ice. It also features two world records: the largest span (30 meters) and the highest thin shell structure (30,5 meters) in ice as well as a method for the construction of a fully laminated shell structure in insulated glass.

Concrete in the Service of Mankind Thomas Telford

In this volume on the mechanics of fracture of Portland cement concrete, the general theme is the connection between microstructural phenomena and macroscopic models. The issues addressed include techniques for observation over a wide range of scales, the influence of microcracking on common measures of strength and deformability, and ultimately, the relationship between microstructural changes in concrete under load and its resistance to cracking. It is now commonly accepted that, in past attempts to force-fit the behavior of concrete into the rules of linear elastic fracture

mechanics, proper attention has not been paid to scale effects. Clearly, the relationships among specimen size, crack length and opening, and characteristic material fabric dimensions have been, in comparison to their counterparts in metals, ceramics, and rocks, abused in concrete. Without a fundamental understanding of these relationships, additional testing in search of the elusive, single measure of fracture toughness has spawned additional confusion and frustration. No one is in a better position to document this observation than Professor Mindess.

High-strength Concrete Penguin Random House India Private Limited

This book gathers the latest advances, innovations, and applications in the field of environmental and construction engineering, as presented by international researchers at the XXV International Scientific Conference "Construction: The Formation of Living Environment", held in Moscow, Russia on April 20-22, 2022. It covers highly diverse topics, including sustainable innovative development of the construction industry, building materials, reliability of buildings and constructions and safety in construction, modelling and mechanics of building structures, engineering and smart systems in construction, climate change and urban environment. The contributions, which were selected by means of a rigorous international peer-review process, highlight numerous exciting ideas that will spur novel research directions and foster multidisciplinary collaborations.

Fracture mechanics of concrete: Material characterization and testing CRC Press

This fourth volume of *Concrete in the Service of Mankind* focuses on radical concrete technology. Concrete is ubiquitous and unique, and is found in every developed and developing country. Indeed, there are no alternatives to concrete as a volume construction material for infrastructure. This raises important questions of how concrete should be designed and constructed for cost effective use in the the short and long term, and to encourage further radical development. Equally, it must be environmentally friendly during manufacture, in an aesthetic presentation in structures and in the containment of harmful materials. This book should be of interest to concrete technologists; contractors; civil engineers; consultants; government agencies; research organizations.

Notes on Concrete and Works in Concrete kassel university press GmbH

Textile reinforced concrete (TRC) has emerged in recent years as an attractive new high performance cement-based composite. Textiles can significantly improve the mechanical behavior of cement matrices under static and dynamic conditions, and give superior tensile strength, toughness, ductility, energy absorption and protection against environmental degrading influences. Flexibility with fabric production methods enables the control of fabric and yarn geometry. This, along with the ability to incorporate into the fabric a range of yarns of different types and performances, as well as cement matrix modifications, enables design of the composite to a wide range of needs. The book is intended to provide a comprehensive treatment of TRC, covering the basic fundamentals of the composite material itself and the principles governing its performance on a macro-scale as a component in a structure. It provides in-depth treatment of the fabric, methods for production of the composite, the micro-mechanics with special attention to the role of bonding and microstructure, behavior under static and dynamic loading, sustainability, design, and the applications of TRC composites.

Proceedings of FORM 2022 FIB - International Federation for Structural Concrete

This practical book from a highly experienced author presents clearly the means and methods for designing, producing and using high-strength concrete. High-strength concrete offers many benefits. Higher compressive strengths allow for a reduction in the cross-sectional dimensions of columns and walls in buildings. Its greater stiffness allows for increasing building heights while controlling sway and occupant comfort. Civil structures such as bridges have benefited from greater span lengths, shallower beam sections, wider girder spacing, and extended service life. Illustrated with real life examples, through documented case histories, High-Strength Concrete will be a valuable resource for contractors, producers, inspection agencies, as well as engineers and researchers.

Materials Encyclopedia for Creatives CRC Press

Buildings and infrastructure represent principal assets of any national economy as well as prime sources of environmental degradation. Making them more sustainable represents a key challenge for the construction, planning and design industries and governments at all levels; and the rapid urbanisation of the 21st century has turned this into a global challenge. This book embodies the results of a major research programme by members of the Australia Co-operative Research Centre for Construction Innovation and its global partners, presented for an international audience of construction researchers, senior professionals and advanced students. It covers four themes, applied to regeneration as well as to new build, and within the overall theme of Innovation: Sustainable Materials and Manufactures, focusing on building material products, their manufacture and assembly - and the reduction of their ecological 'fingerprints', the extension of their service lives, and their re-use and recyclability. It also explores the prospects for applying the principles of the assembly line. Virtual Design, Construction and Management, viewed as increasing sustainable development through automation, enhanced collaboration (such as virtual design teams), real time BL performance assessment during design, simulation of the construction process, life-cycle management of project information (zero information loss) risk minimisation, and increased potential for innovation and value adding. Integrating Design, Construction and Facility Management over the Project Life Cycle, by converging ICT, design science engineering and sustainability science. Integration across spatial scales, enabling building-infrastructure synergies (such as water and energy efficiency). Convergences between IT and design and operational processes are also viewed as a key platform increased sustainability.

High-Strength Concrete CRC Press

Ferrocement is a versatile, construction material, with applications in low cost housing, rehabilitation, strengthening and repair of structures. This book presents the latest developments in research and application of the material.

Advances in Civil Engineering and Infrastructural Development CRC Press

Materials and the myriad technologies that have been developed to manipulate them are of essential relevance to product designers, architects, artists and stylists, as they represent the starting point for every product and every architectural work. The book is an encyclopaedic compendium of around 1,000 terms in this field, from aerogel to marble to zirconium. It features traditional and frequently used materials, as well as new and unexpected ones. Their respective advantages and disadvantages are precisely described. In addition, terms related to production processes, such as upcycling or tanning, or that describe the properties of materials or are closely related to the topic have also been included.

High-strength Concrete RILEM Publications

Civil Engineering and Urban Planning III addresses civil engineering and urban planning issues associated with transportation and the environment. The contributions not only highlight current practices in these areas, but also pay attention to future research and applications, and provide an overview of the progress made in a wide variety of topics

Shear Strength of Prestressed Concrete T-beams with Welded Wire Fabric as Shear Reinforcement CRC Press

This book comprises selected proceedings of the International Conference on Recent Advancements in Civil Engineering and Infrastructural Developments (ICRACEID 2019). The contents are broadly divided into five areas (i) smart transportation with urban planning, (ii) clean energy and environment, (iii) water distribution and waste management, (iv) smart materials and structures, and (v) disaster management. The book aims to provide solutions to global challenges using innovative and emerging technologies covering various fields of civil engineering. The major topics covered include urban planning, transportation, water distribution, waste management, disaster management, environmental pollution and control, environmental impact assessment, application of GIS and remote sensing, and structural analysis and design. Given the range of topics discussed, the book will be beneficial for students, researchers as well industry professionals.

Strength and Related Properties of Concrete John Wiley & Sons

Lightweight structures and material optimized systems are of major relevance in the building industry and particularly in the design of concrete structures. This is not only for aesthetic reasons, but also to use material in a resource conserving way. The increase of strength characteristics, as one measure to reduce cross section dimensions, postulates the prefabrication of cementitious materials under laboratory conditions. This thesis examines the contradiction of the possibility to realize slender concrete elements and the complexity of the discontinued homogeneity arising from

necessary segmentations. Proposals of implementation strategies are demonstrated and verified on the basis of selected case studies.

Processing of Slender Concrete Shells - Fabrication and Installation Craftsman Book Company

This new textbook has two main themes. The first is Modern Methods of Construction (MMC) which is the off-site manufacture of a wide spectrum of products, ranging from whole buildings to be transported onto site, down to smaller units or components for site integration. The second theme describes the innovation and progress towards carbon zero by the major generators of CO₂ in the construction industry - namely cement, steel and masonry. The first section of the book describes and illustrates with photographs, the major forms of Modern Methods of Construction. These include fully completed 3D units, panelised systems, pods, sub-assemblies and on-site MMC. The section on Innovative Materials then describes a wide range of construction products which are entering into the built environment sector. Some new entrants are variants on well-established construction materials such as steel and concrete. Materials such as these will remain major construction materials for the foreseeable future, but their composition and manufacturing processes will inevitably have to change. Timber also will remain a major construction material, but sustainable sourcing is key and its utilisation as cross-lamination timber (CLT) or as modified timber is rapidly developing. As a result, students and practitioners must familiarise themselves with these materials, their composition, and various uses. The book goes on to describe variants of other traditional building products, such as glass, plastic and insulation, which are undergoing major developments leading towards enhanced environmental sustainability, as well as many emergent materials, some of which are likely to be significant in future. Modern Methods of Construction and Innovative Materials is the only book combining these important elements of the future of the industry in an easy-to-read guide for students and new practitioners. It is essential reading for anyone studying and working in the built environment, be they architects, construction managers, surveyors or engineers.