

Durability Of Cfrp Strengthened Concrete Structures Under

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FRP - J. G. Teng 2002

The strengthening of reinforced concrete (RC) structures using advanced fibre-reinforced polymer (FRP) composites, and in particular the behaviour of FRP-strengthened RC structures is a topic which has become very popular in recent years. This popularity has arisen due to the need to maintain and upgrade essential infrastructure in all parts of the world, combined with the well-known advantages of FRP composites, such as good corrosion resistance and ease for site handling due to their light weight. The continuous reduction in the material cost of FRP composites has also contributed to their popularity. While a great amount of research now exists in the published literature on this topic, it is scattered in various journals and conference proceedings. This book therefore provides the first ever comprehensive, state-of-the-art summary of the existing research on FRP strengthening of RC structures, with the emphasis being on structural behaviour and strength models. The main topics covered include: * bond behaviour * flexural and shear strengthening of beams * column strengthening * flexural strengthening of slabs. For each area, the methods of strengthening are discussed, followed by a description of behaviour and failure modes and then the presentation of rational design recommendations, for direct use in practical design of FRP strengthening measures. Researchers, practicing engineers, code writers and postgraduate students in structural engineering and construction materials, as well as consulting firms, government departments, professional bodies, contracting firms and FRP material suppliers will find this an invaluable resource.

Repair and Renovation of Concrete Structures - Ravindra K. Dhir 2005

- Preface - Introduction - Organising Committee - Scientific and Technical Committee - Collaborating Institutions - Sponsoring Organisations with Exhibition - Exhibiting Organisations - Supporting Institutions - Opening Paper - Getting it Right - From Testing Through Diagnosis to Lasting Repair THEME 1 DEGRADATION OF CONCRETE STRUCTURES Keynote Paper - On the Role of Moisture in Degradation of Concrete Structures - Condition Survey of Romanian Prestressed Concrete Bridges - The Use of Air Entrainment in Bridges and Highway Structures of the USA - Influence of Design and Construction Details on Localized Degradation of Concrete Structures - Diagnosis and Repair of a Cement Concrete Structure: A Case Study of a Residential Building - Degradation of Concrete in Structures - Water Treatment Infrastructure - Models for Environmental Actions on Reinforced Concrete Structures - Influence of Desulfurised Combustion Gases on Durability of Cooling Towers - Studying the Bond Between Repair Materials and Concrete Substrate - Mathematical Modelling of Strike Penetration Processes into Concrete and Sandy Barriers THEME 2 DEVELOPMENTS IN DIAGNOSTIC TECHNIQUES Keynote Paper - Cover Concrete Evaluation: The Contribution of GRP Techniques Experimental Studies and Field Measurements - Cost Effective Testing of Concrete Structures - Defeating Alkali-Aggregate Reaction Worldwide - Temperature Variations in Concrete Subjected to Cyclic Compressive Loads: Consequences for Diagnostic Applications - A Study About the Rehabilitation Method of Electrochemical Chloride Extraction in Brazil - Loading Tests - Practical Experiences - Possibilities of Optical Fibre Sensors to Monitor Strength in Concrete Structures - Durability of Marine and Coastal Structures - The High Quality Cover and Monitoring Approach - New Suggestions to Measure the Corrosion Level of Reinforcement Using Infrared Thermographic Technology - Fracture Energy of Ultra High Performance Concrete Beams Using Infrared Thermographic Technology - Development of an Automatic Crack Recognition System for Concrete Structures - A Non-Destructive Test to Measure Concrete Permeability - Ultrasonic Inspection of Concrete Structure - New Steps Towards "Transparent" Concrete - On Bonding Repairing Steel Fibre Reinforced

Concrete to Hardened Concrete - Condition Assessment of RC Structures by Electro Chemical Method (Linear Polarization) and Accelerated Carbonation Experiments THEME 3: REPAIR MATERIALS AND METHODS Keynote Paper - New Materials. Concepts and Quality Control Systems for Strengthening Concrete Construction - Repair of Foundation for Large Compressor - On the Use of Non-Adequate Primers to the Reinforcing Steel in Concrete Localised Repairs - Evaluating External CFRP Strips and Internal MMFX Steel Shear Bars for Shear Strengthening of Precast Concrete Channel Beams - Evaluation of Corrosion Inhibitors for Remediation of St Mary's Multi-Storey Car Park, Colchester - Improving Efficiency in the Galvanic Cathodic Protection of Concrete Structures - Re-alkalisation of Carbonated Concrete by Alkalline Solutions Absorption and Diffusion Mechanisms - External CFRP Tendons for Bridge Strengthening in Austria - Anchorage of Additional External Prestressing Tendons - Determination of Ductility and Deformability Undeces for FRP Strengthened RC Slabs - Use of FRP Materials for Strengthening Concrete Structures - Effect of Temperature on the Durability of Systems of Strengthening of Concrete Structures - Axial Compressive Strength of Reinforced Concrete Columns Wrapped with Fibre Reinforced Polymers (FRP) - Efficiency of Hybrid FRP Sheets in Strengthening Concrete Beams - Embedded Fibre Bragg Grating Sensors for Monitoring the Health of Concrete Structures - Performances of Bonded An

Fatigue, Durability, and Fracture Mechanics - S. Seetharamu 2020-10-01

This book presents selected papers presented during Fatigue Durability India 2019. The contents of this volume discuss advances in the field of fatigue, durability, and fracture, and cover mechanical failure and its applications. The chapters cover a wide spectrum of topics, including design, engineering, testing and computational evaluation of the components or systems for fatigue, durability, and fracture mechanics. The contents of this book will appeal not only to academic researchers, but also to design engineers, failure analysts, maintenance engineers, certification personnel, and R&D professionals involved in a wide variety of industries.

Textiles, Polymers and Composites for Buildings - G Pohl 2010-09-27

Textiles, polymers and composites are increasingly being utilised within the building industry. This pioneering text provides a concise and representative overview of the opportunities available for textile, polymer and composite fibres to be used in construction and architecture. The first set of chapters examine the main types and properties of textiles, polymers and composites used in buildings. Key topics include the types and production of textiles, the use of polymer foils and fibre reinforced polymer composites as well as textiles and coatings for tensioned membrane structures. The second part of the book presents a selection of applications within the building industry. Chapters range from the use of textiles in tensile structures, sustainable building concepts with textile materials, innovative composite-fibre applications for architecture, to smart textile and polymer fibres for structural health monitoring. With its distinguished editor and team of international contributors, Textiles, polymers and composites for buildings is an important reference for architects, fabric manufacturers, fibre-composite experts, civil engineers, building designers, academics and students. Provides a concise and representative overview of the opportunities available for textile, polymer and composite fibres to be used in construction Provides an insight into how high-tech textiles already influence our daily lives as well as potential applications in modern buildings Features a thorough discussion of technical characteristics and requirements of textiles used for buildings and construction

Fibre-Reinforced Polymer Reinforcement for Concrete Structures - Kiang Hwee Tan 2003

Fibre-reinforced polymer (FRP) reinforcement has been used in construction as either internal or external reinforcement for concrete structures in the past decade. This book provides the latest research findings related to the development, design and application of FRP reinforcement in new construction and rehabilitation works. The topics include FRP properties and bond behaviour, externally bonded reinforcement for flexure, shear and confinement, FRP structural shapes, durability, member behaviour under sustained loads, fatigue loads and blast loads, prestressed FRP tendons, structural strengthening applications, case studies, and codes and standards.

FRP Composites - S. S. J. Moy 2001

- Introduction - Design specification - Design process overview - Design of composite - Structural design - Implementation - Tests - Verification - Monitoring - References Reviews Fibre reinforced polymer (FRP) composites have been used for many years in the aircraft and shipbuilding industries. They are now being used in a variety of construction applications where their light weight, high strength, stiffness, durability, and ease of installation makes them cost effective. This is particularly true in the repair and rehabilitation of existing infrastructure. This book provides design guidance on the use of fibre reinforced polymer composites, based on the results of two major programmes funded by the DETR. The book demonstrates that fibre reinforced polymer composites can be used with complete confidence in structural applications. Likewise, guidance is given on short-term and long-term behaviour and how this can be interpreted within a factual design situation. Also included are case studies of projects on the London Underground network, alongside contributions from industry research groups. FRP composites can offer a performance or cost benefit over traditional solutions. As there are no official standards for this type of work, this first attempt at producing design recommendations will be a vital resource for structural engineers. Quality Concrete, October 2001

10th International Conference on FRP Composites in Civil Engineering - Alper Ilki 2021-11-26

This volume highlights the latest advances, innovations, and applications in the field of FRP composites and structures, as presented by leading international researchers and engineers at the 10th International Conference on Fibre-Reinforced Polymer (FRP) Composites in Civil Engineering (CICE), held in Istanbul, Turkey on December 8-10, 2021. It covers a diverse range of topics such as All FRP structures; Bond and interfacial stresses; Concrete-filled FRP tubular members; Concrete structures reinforced or pre-stressed with FRP; Confinement; Design issues/guidelines; Durability and long-term performance; Fire, impact and blast loading; FRP as internal reinforcement; Hybrid structures of FRP and other materials; Materials and products; Seismic retrofit of structures; Strengthening of concrete, steel, masonry and timber structures; and Testing. The contributions, which were selected by means of a rigorous international peer-review process, present a wealth of exciting ideas that will open novel research directions and foster multidisciplinary collaboration among different specialists.

Concrete Solutions 2014 - Michael Grantham 2014-08-18

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. Subsequent conferences have seen us partnering with the University of Padua in 2009 and with TU Dresden in 2011. This conference is being held for the first time in the UK, in associ

Rehabilitation of Concrete Structures with Fiber-Reinforced Polymer - Riadh Al-Mahaidi 2018-11-12

Rehabilitation of Concrete Structures with Fiber Reinforced Polymer is a complete guide to the use of FRP in flexural, shear and axial strengthening of concrete structures. Through worked design examples, the authors guide readers through the details of usage, including anchorage systems, different materials and methods of repairing concrete structures using these techniques. Topics include the usage of FRP in concrete structure repair, concrete structural deterioration and rehabilitation, methods of structural rehabilitation and strengthening, a review of the design basis for FRP systems, including strengthening limits, fire endurance, and environmental considerations. In addition, readers will find sections on the strengthening of members under flexural stress, including failure modes, design procedures, examples and anchorage detailing, and sections on shear and torsion stress, axial strengthening, the installation of FRP systems, and strengthening against extreme loads, such as earthquakes and fire, amongst other important

topics. Presents worked design examples covering flexural, shear, and axial strengthening Includes complete coverage of FRP in Concrete Repair Explores the most recent guidelines (ACI440.2, 2017; AS5100.8, 2017 and Concrete society technical report no. 55, 2012)

Strengthening Design of Reinforced Concrete with FRP - Hayder A. Rasheed 2014-12-16

Strengthening Design of Reinforced Concrete with FRP establishes the art and science of strengthening design of reinforced concrete with fiber-reinforced polymer (FRP) beyond the abstract nature of the design guidelines from Canada (ISIS Canada 2001), Europe (FIB Task Group 9.3 2001), and the United States (ACI 440.2R-08). Evolved from thorough class notes used to teach a graduate course at Kansas State University, this comprehensive textbook: Addresses material characterization, flexural strengthening of beams and slabs, shear strengthening of beams, and confinement strengthening of columns Discusses the installation and inspection of FRP as externally bonded (EB) or near-surface-mounted (NSM) composite systems for concrete members Contains shear design examples and design examples for each flexural failure mode independently, with comparisons to actual experimental capacity Presents innovative design aids based on ACI 440 code provisions and hand calculations for confinement design interaction diagrams of columns Includes extensive end-of-chapter questions, references for further study, and a solutions manual with qualifying course adoption Delivering a detailed introduction to FRP strengthening design, Strengthening Design of Reinforced Concrete with FRP offers a depth of coverage ideal for senior-level undergraduate, master's-level, and doctoral-level graduate civil engineering courses.

Proceedings of the Second International Conference of Construction, Infrastructure, and Materials - Han Ay Lie 2022

This book comprises selected proceedings of the 2nd International Conference of Construction, Infrastructure, and Materials (ICCIM 2021) focusing on topics such as structural engineering, construction materials, geotechnical engineering, transportation system and engineering, construction management, water resources engineering, and infrastructure development. Its content will be useful to researchers, educators, practitioners, and policymakers alike.

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.

Strengthening of Concrete Structures Using Fiber Reinforced Polymers (FRP) - Hwai-Chung Wu 2017-02-21

Strengthening of Concrete Structures Using Fiber Reinforced Polymers (FRP): Design, Construction and Practical Applications presents a best practice guide on the structural design and strengthening of bridge structures using advanced Fiber Reinforced Polymer (FRP) composites. The book briefly covers the basic concepts of FRP materials and composite mechanics, while focusing on practical design and construction issues, including inspection and quality control, paying special attention to the differences in various design codes (US, Japan, and Europe) and recommendations. At present, several design guides from the US, Japan, and Europe are available. These guidelines are often inconsistent and do not cover all necessary design and inspection issues to the same degree of detail. This book provides a critical review and comparison of these guidelines, and then puts forward best practice recommendations, filling a significant gap in the literature, and serving as an important resource for engineers, architects, academics, and students interested in FRP materials and their structural applications. Written from a practitioner's point-of-view, it is a valuable design book for structural engineers all over the world. Includes a large quantity of design examples and structural software to facilitate learning and help readers perform routine design Provides

recommendations for best practices in design and construction for the strengthening of bridge structures using advanced fiber-reinforced polymer (FRP) composites Presents comprehensive guidelines on design, inspection, and quality control, including laboratory and field testing information
Fibre-reinforced Polymer Reinforcement For Concrete Structures (In 2 Volumes) - Proceedings Of The Sixth International Symposium On Frp Reinforcement For Concrete Structures (Frprcs-6) - Kiang Hwee Tan 2003-06-20

Fibre-reinforced polymer (FRP) reinforcement has been used in construction as either internal or external reinforcement for concrete structures in the past decade. This book provides the latest research findings related to the development, design and application of FRP reinforcement in new construction and rehabilitation works. The topics include FRP properties and bond behaviour, externally bonded reinforcement for flexure, shear and confinement, FRP structural shapes, durability, member behaviour under sustained loads, fatigue loads and blast loads, prestressed FRP tendons, structural strengthening applications, case studies, and codes and standards.

Advances in Civil Function Structure and Industrial Architecture - Qing Wang 2022-11-08
Advances in Civil Function Structure and Industrial Architecture contains the Proceedings of 5th International Conference on Civil Function Structure and Industrial Architecture (CFSIA 2022), which was held on January 21-23, 2022, in Harbin, China. The Proceedings of CFSIA 2022 is intended to share scientific research results and cutting-edge technologies in the field of civil function structure and control engineering. Researchers, practitioners and academics in these disciplines will find the book useful. Over 90 papers are featured. Many topics are covered, but the contributions may be seen to fall into one of six broad themes of the conference, namely: (i) Engineering Structure (Engineering Advanced Technology, Engineering Structure and Seismic Resistance, High-rise Building and Large-span Structure, Bridge Engineering, Special Structure, Construction Technology, Monitoring and Control of Structure, Cartography and GIS, Concrete Structure, Construction and Control, etc.); (ii) Intelligent Building (Predictive Maintenance, Converged Networks, Wireless Retrofit, Biometric Integration, Computer Management System Engineering, Building Equipment Automatic Control System Engineering, etc.); (iii) Smart City (Intelligent Construction, Intelligent Transportation, Risk Management and Decision Making for Intelligent Construction, Intelligent Building Automation Control System, etc.); (iv) Structural Seismic Resistance (Structural Seismic Design, Earthquakes and Ground Motions, Building Site, Foundation and Basis, Principles of Structural Seismic Design Calculation, Seismic Shear Adjustment and Minimum Seismic Shear Requirements, etc.); (v) Monitoring and Testing (Steel Structure Stress Monitoring, Stress Change Monitoring for Large Construction Projects, Structural Health Monitoring, Foundation Pit Monitoring, Temperature Monitoring for Large Volume Concrete Pouring, etc.); (vi) Engineering Facility (Machinery Facility, Electrical Facility, Stationary Facility, Non-standard Facility, Compressor, Continuous Transmission Facility, etc.).

Creative Systems in Structural and Construction Engineering - Amarjit Singh 2017-11-22

An examination of creative systems in structural and construction engineering taken from conference proceedings. Topics covered range from construction methods, safety and quality to seismic response of structural elements and soils and pavement analysis.

Composite Materials for Bridge Repair in Cold Region - M. Mozahid Hossain 2012-06

The deterioration of concrete structures is a major concern to the infrastructure community. Typical sources of deterioration may include aging, increased service load, and environmental damage. Structural rehabilitation using carbon fiber reinforced polymer (CFRP) sheets has recently attracted attention to the infrastructure community because of the superior strengthening effects in comparison to conventional repair methods. The CFRP sheets may be bonded on the deteriorated concrete structure using bonding agents to enhance load-carrying capacity. The most important consideration in such a strengthening method may be the long term durability under harsh environmental conditions. Furthermore, premature debonding of bonded CFRP sheets may also cause significant losses of the strengthening effects. Although extensive research has been reported on the debonding mechanism of CFRP sheets, there is still lack of understanding on the durability of CFRPs subject to low temperature effects. This book mainly focused on the durability performance of concrete members strengthened with CFRP sheets subjected to harsh

environments.

Fourth Canada-Japan Workshop on Composites - Suong V. Hoa 2020-09-23

While this proceedings volume deals primarily with the conventional areas of metal, ceramic, and polymer composites for civil construction, several of the papers report on new developments in the emerging fields of wood and nanocomposites. The 63 papers from the September 2002 workshop includes the further integration of the fabrication and function processes, aspects of the scale of components which improve the competitive position of composites relative to conventional materials and the exploitation of new types of composite such as nanocomposites which exploit a variety of new length scales to achieve their functionality. This also gives rise to multifunctional composites which have attributes other than structural properties. In this talk these aspects of the future of composites will be explored and illustrated.

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 contains 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.

Bridge Maintenance, Safety, Management, Life-Cycle Sustainability and Innovations - Hiroshi Yokota 2021-04-20

Bridge Maintenance, Safety, Management, Life-Cycle Sustainability and Innovations contains lectures and papers presented at the Tenth International Conference on Bridge Maintenance, Safety and Management (IABMAS 2020), held in Sapporo, Hokkaido, Japan, April 11-15, 2021. This volume consists of a book of extended abstracts and a USB card containing the full papers of 571 contributions presented at IABMAS 2020, including the T.Y. Lin Lecture, 9 Keynote Lectures, and 561 technical papers from 40 countries. The contributions presented at IABMAS 2020 deal with the state of the art as well as emerging concepts and innovative applications related to the main aspects of maintenance, safety, management, life-cycle sustainability and technological innovations of bridges. Major topics include: advanced bridge design, construction and maintenance approaches, safety, reliability and risk evaluation, life-cycle management, life-cycle sustainability, standardization, analytical models, bridge management systems, service life prediction, maintenance and management strategies, structural health monitoring, non-destructive testing and field testing, safety, resilience, robustness and redundancy, durability enhancement, repair and rehabilitation, fatigue and corrosion, extreme loads, and application of information and computer technology and artificial intelligence for bridges, among others. This volume provides both an up-to-date overview of the field of bridge engineering and significant contributions to the process of making more rational decisions on maintenance, safety, management, life-cycle sustainability and technological innovations of bridges for the purpose of enhancing the welfare of society. The Editors hope that these Proceedings will serve as a valuable reference to all concerned with bridge structure and infrastructure systems, including engineers, researchers, academics and students from all areas of bridge engineering.

Non-Metallic (FRP) Reinforcement for Concrete Structures - L. Taerwe 2004-06-02

Dealing with a wide range of non-metallic materials, this book opens up possibilities of lighter, more durable structures. With contributions from leading international researchers and design engineers, it provides a complete overview of current knowledge on the subject.

Issues in Structural and Materials Engineering: 2013 Edition - 2013-05-01

Issues in Structural and Materials Engineering: 2013 Edition is a ScholarlyEditions™ book that delivers timely, authoritative, and comprehensive information about Computer Engineering. The editors have built Issues in Structural and Materials Engineering: 2013 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about Computer Engineering in this book to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Issues in Structural and Materials Engineering: 2013 Edition has been produced by the world's leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority,

confidence, and credibility. More information is available at <http://www.ScholarlyEditions.com/>.

FRP Composites in Civil Engineering - CICE 2004 - R. Seracino 2004-12-15

The range of fibre-reinforced polymer (FRP) applications in new construction, and in the retrofitting of existing civil engineering infrastructure, is continuing to grow worldwide. Furthermore, this progress is being matched by advancing research into all aspects of analysis and design. The Second International Conference on FRP Composites in Maintenance, Safety, Risk, Management and Life-Cycle Performance of Bridges - Nigel Powers 2018-07-04 Maintenance, Safety, Risk, Management and Life-Cycle Performance of Bridges contains lectures and papers presented at the Ninth International Conference on Bridge Maintenance, Safety and Management (IABMAS 2018), held in Melbourne, Australia, 9-13 July 2018. This volume consists of a book of extended abstracts and a USB card containing the full papers of 393 contributions presented at IABMAS 2018, including the T.Y. Lin Lecture, 10 Keynote Lectures, and 382 technical papers from 40 countries. The contributions presented at IABMAS 2018 deal with the state of the art as well as emerging concepts and innovative applications related to the main aspects of bridge maintenance, safety, risk, management and life-cycle performance. Major topics include: new design methods, bridge codes, heavy vehicle and load models, bridge management systems, prediction of future traffic models, service life prediction, residual service life, sustainability and life-cycle assessments, maintenance strategies, bridge diagnostics, health monitoring, non-destructive testing, field testing, safety and serviceability, assessment and evaluation, damage identification, deterioration modelling, repair and retrofitting strategies, bridge reliability, fatigue and corrosion, extreme loads, advanced experimental simulations, and advanced computer simulations, among others. This volume provides both an up-to-date overview of the field of bridge engineering and significant contributions to the process of more rational decision-making on bridge maintenance, safety, risk, management and life-cycle performance of bridges for the purpose of enhancing the welfare of society. The Editors hope that these Proceedings will serve as a valuable reference to all concerned with bridge structure and infrastructure systems, including students, researchers and engineers from all areas of bridge engineering.

Computational Mechanics, Materials and Engineering Applications - Jian Rong Yang 2011-12-22

Volume is indexed by Thomson Reuters CPCI-S (WoS). Following the great progress made in Computational Mechanics and Materials, the 2011 International Workshop on Computational Mechanics, Materials and Engineering Applications (CMMEA 2011) aimed at providing a forum for the presentation and discussion of state-of-the-art developments in Computational Mechanics and Engineering Applications, Building Materials, Geotechnical & Soil Engineering and Materials Science and Engineering Applications. The emphasis was placed on basic methodologies, scientific developments and engineering applications.

Proceedings of EcoComfort 2020 - Zinoviy Blikharsky 2020-08-16

This book gathers the latest innovations and applications in the field of resource-saving technologies and advanced materials in civil and environmental engineering, as presented by leading international researchers and engineers at the 2nd International Scientific Conference EcoComfort and Current Issues of Civil Engineering, held in Lviv, Ukraine on September 16-18, 2020. It covers a diverse range of topics, including ecological and energy-saving technologies; renewable energy sources; heat, gas and water supply; microclimate provision systems; innovative building materials and products; smart technologies in water purification and treatment; protection of water ecosystems; and architectural shaping and structural solutions. The contributions, which were selected using a rigorous international peer-review process, highlight exciting ideas that will spur novel research directions and foster multidisciplinary collaborations.

Bond Behaviour of FRP in Structures - J. F. Chen 2005

Durability of Composites for Civil Structural Applications - Vistasp M. Karbhari 2007-07-25

Given the increasing use of fibre-reinforced polymer (FRP) composites in structural civil engineering, there is a vital need for critical information related to the overall durability and performance of these new materials under harsh and changing conditions. Durability of composites for civil and structural applications provides a thorough overview of key aspects of the durability of FRP composites for designers and practising engineers. Part one discusses general aspects of composite durability. Chapters examine

mechanisms of degradation such as moisture, aqueous solutions, UV radiation, temperature, fatigue and wear. Part two then discusses ways of using FRP composites, including strengthening and rehabilitating existing structures with FRP composites, and monitoring techniques such as structural health monitoring. Durability of composites for civil and structural applications provides practising engineers, decision makers and students with a useful and fundamental guide to the use of FRP composites within civil and structural engineering. Provides a thorough overview of key aspects of the durability of composites Examines mechanisms of degradation such as aqueous solutions, moisture, fatigue and wear Discusses ways of using FRP composites, including strengthening and rehabilitating existing structures

Brick and Block Masonry - Claudio Modena 2016-11-03

Brick and Block Masonry - Trends, Innovations and Challenges contains the lectures and regular papers presented at the 16th International Brick and Block Masonry Conference (Padova, Italy, 26-30 June 2016). The contributions cover major topics: - Analysis of masonry structures - Bond of composites to masonry - Building physics and durability - Case studies - Codes and standards - Conservation of historic buildings - Earthen constructions - Eco-materials and sustainability - Fire resistance, blasts, and impacts - Masonry bridges, arches and vaults - Masonry infill walls and RC frames - Masonry materials and testing - Masonry repair and strengthening - New construction techniques and technologies - Reinforced and confined masonry - Seismic performance and vulnerability assessment In an ever-changing world, in which innovations are rapidly implemented but soon surpassed, the challenge for masonry, the oldest and most traditional building material, is that it can address the increasingly pressing requirements of quality of living, safety, and sustainability. This abstracts volume and full paper USB device, focusing on challenges, innovations, trends and ideas related to masonry, in both research and building practice, will prove to be a valuable source of information for researchers and practitioners, masonry industries and building management authorities, construction professionals and educators.

Advanced High Strength Natural Fibre Composites in Construction - Mizi Fan 2016-10-04

Advanced High Strength Natural Fibre Composites in Construction provides the basic framework and knowledge required for the efficient and sustainable use of natural fiber composites as a structural and building material, along with information on the ongoing efforts to improve the efficiency of use and competitiveness of these composites. Areas of particular interest include understanding the nature and behavior of raw materials and their functional contributions to the advanced architectures of high strength composites (Part 1), discussing both traditional and novel manufacturing technologies for various advanced natural fiber construction materials (Part 2), examining the parameters and performance of the composites (Part 3), and finally commenting on the associated codes, standards, and sustainable development of advanced high strength natural fiber composites for construction. This exposition will be based on well understood environmental science as it applies to construction (Part 4). The book is aimed at academics, research scholars, and engineers, and will serve as a most valuable text or reference book that challenges undergraduate and postgraduate students to think beyond standard practices when designing and creating novel construction materials. Presents the first comprehensive review on the efficient and sustainable use of natural fiber composites in construction and building materials Contains detailed information on the structure, chemical composition, and physical and mechanical properties of natural fibers Covers both traditional and novel manufacturing technologies for high strength natural fiber composites Includes material parameters and performance in use, as well as associated codes, standards, and applied case studies Presents contributions from leading international experts in the field

Mechanics of Structures and Materials XXIV - Hong Hao 2016-11-30

Mechanics of Structures and Materials: Advancements and Challenges is a collection of peer-reviewed papers presented at the 24th Australasian Conference on the Mechanics of Structures and Materials (ACMSM24, Curtin University, Perth, Western Australia, 6-9 December 2016). The contributions from academics, researchers and practising engineers from Australasian, Asia-pacific region and around the world, cover a wide range of topics, including: • Structural mechanics • Computational mechanics • Reinforced and prestressed concrete structures • Steel structures • Composite structures • Civil engineering materials • Fire engineering • Coastal and offshore structures • Dynamic analysis of structures • Structural health monitoring and damage identification • Structural reliability analysis and design •

Structural optimization • Fracture and damage mechanics • Soil mechanics and foundation engineering • Pavement materials and technology • Shock and impact loading • Earthquake loading • Traffic and other man-made loadings • Wave and wind loading • Thermal effects • Design codes Mechanics of Structures and Materials: Advancements and Challenges will be of interest to academics and professionals involved in Structural Engineering and Materials Science.

Proceedings fib Symposium in Tel-Aviv Israel - FIB - International Federation for Structural Concrete 2013-04-01

Bridge Safety, Maintenance, Management, Life-Cycle, Resilience and Sustainability - Joan Ramon Casas 2022-06-26

Bridge Safety, Maintenance, Management, Life-Cycle, Resilience and Sustainability contains lectures and papers presented at the Eleventh International Conference on Bridge Maintenance, Safety and Management (IABMAS 2022, Barcelona, Spain, 11-15 July, 2022). This e-book contains the full papers of 322 contributions presented at IABMAS 2022, including the T.Y. Lin Lecture, 4 Keynote Lectures, and 317 technical papers from 36 countries all around the world. The contributions deal with the state-of-the-art as well as emerging concepts and innovative applications related to the main aspects of safety, maintenance, management, life-cycle, resilience, sustainability and technological innovations of bridges. Major topics include: advanced bridge design, construction and maintenance approaches, safety, reliability and risk evaluation, life-cycle management, life-cycle, resilience, sustainability, standardization, analytical models, bridge management systems, service life prediction, structural health monitoring, non-destructive testing and field testing, robustness and redundancy, durability enhancement, repair and rehabilitation, fatigue and corrosion, extreme loads, needs of bridge owners, whole life costing and investment for the future, financial planning and application of information and computer technology, big data analysis and artificial intelligence for bridges, among others. This volume provides both an up-to-date overview of the field of bridge engineering and significant contributions to the process of making more rational decisions on bridge safety, maintenance, management, life-cycle, resilience and sustainability of bridges for the purpose of enhancing the welfare of society. The volume serves as a valuable reference to all concerned with and/or involved in bridge structure and infrastructure systems, including students, researchers and practitioners from all areas of bridge engineering.

Engineering Challenges for Sustainable Future - Noor Amila Wan Abdullah Zawawi 2016-12-01

Engineering Challenges for Sustainable Future contains the papers presented at the 3rd International Conference on Civil, Offshore & Environmental Engineering (ICCOEE2016, Kuala Lumpur, Malaysia, 15-17 August 2016), under the banner of World Engineering, Science & Technology Congress (ESTCON2016). The ICCOEE series of conferences started in Kuala Lumpur, Malaysia 2012, and the second event of the series took place in Kuala Lumpur, Malaysia 2014. This conference series deals with the civil, offshore & environmental engineering field, addressing the following topics: • Environmental and Water Resources Engineering • Coastal and Offshore Engineering • Structures and Materials • Construction and Project Management • Highway, Geotechnical and Transportation Engineering and Geo-informatics This book is an essential reading for academic, engineers and all professionals involved in the area of civil, offshore and environmental engineering.

Quality Assurance of Reinforced Concrete Structures Strengthened by Externally Bonded CFRP Strips - Markus Huber 2010-01-18

Inhaltsangabe:Zusammenfassung: Im Dezember 2002 wurde die erste österreichische Richtlinie bezüglich Stahlbetonverstärkungen mit aufgeklebten CFK-Lamellen veröffentlicht. Das vorrangige Ziel der vorliegenden Diplomarbeit ist, die Durchführbarkeit der neuen Richtlinie - mit speziellem Augenmerk auf Qualitätssicherung - anhand Europas größter CFK-Baustelle (die Wiener Marxerbrücke) zu überprüfen. Die Diplomarbeit enthält eine Übersicht über Eigenschaften und Anforderungen an CFK, deren gängigste Anwendungen als Verstärkung und eine Beschreibung des Hauptbezugsobjekts Marxerbrücke. Die Methoden der Qualitätssicherung nach der neuen Richtlinie werden erklärt und Resultate aus der Qualitätssicherung auf der Marxerbrücke inklusive einer Analyse von Fehlstellen und Sanierungsmethoden werden präsentiert. Anschließend werden die Resultate aus der Qualitätssicherung auf der Marxerbrücke

mit denen von vier anderen CFK-verstärkten Bezugsobjekten verglichen. Abschließend werden Veränderungen bezüglich der Methoden der Qualitätssicherung vorgeschlagen und Empfehlungen für eine zukünftige Ausgabe der österreichischen Richtlinie werden geäußert. Inhaltsverzeichnis:Table of Contents: AbstractI Deutsche KurzfassungII AcknowledgementsIII Table of contents4 1.Content and aims of the thesis7 2.Strengthening with fibre reinforced polymers8 Fibre Reinforced Polymers9 Types of fibres9 2.1.1CFRP products and their properties10 Comparison of strengthening with carbon fibre reinforced polymers and externally bonded steel12 Differences in behaviour under tension12 Advantages of carbon fibre reinforced polymers12 2.1.2Disadvantages of carbon fibre reinforced polymers14 Guidelines and reference works in Austria concerning CFRP and design of strengthening elements14 2.1.3Verifications of the strengthening system according to the Austrian guidelines15 2.1.4Design bending moment capacity17 Preliminary measures and application of CFRP19 Examination of the state of the concrete member before surface preparation19 2.1.5Surface preparation and repair of the concrete member20 2.1.6Application of CFRP Reinforcement21 Basic techniques of strengthening with CFRP21 2.1.7Selected special techniques of strengthening with CFRP24 3.main reference object: Marxerbrücke26 General description of the widening of the Marxerbrücke26 Geographical position26 Arrangement of the structure of the Marxerbrücke27 Division and numeration of the structure27 3.1.1Technical data [...]

Advances in FRP Composites in Civil Engineering - Lieping Ye 2012-02-01

"Advances in FRP Composites in Civil Engineering" contains the papers presented at the 5th International Conference on Fiber Reinforced Polymer (FRP) Composites in Civil Engineering in 2010, which is an official conference of the International Institute for FRP in Construction (IIFC). The book includes 7 keynote papers which are presented by top professors and engineers in the world and 203 papers covering a wide spectrum of topics. These important papers not only demonstrate the recent advances in the application of FRP composites in civil engineering, but also point to future research endeavors in this exciting area. Researchers and professionals in the field of civil engineering will find this book is exceedingly valuable. Prof. Lieping Ye and Dr. Peng Feng both work at the Department of Civil Engineering, Tsinghua University, China. Qingrui Yue is a Professor at China Metallurgical Group Corporation.

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.

Concrete Repair, Rehabilitation and Retrofitting - M. Alexander 2006-01-01

The First International Conference on Concrete Repair, Rehabilitation and Retrofitting (ICRRR 2005) was held in Cape Town, South Africa, from 21-23 November 2005. The conference was a collaborative venture by researchers from the South African Research Programme in Concrete Materials (based at the Universities of Cape Town and The Witwatersrand) and The Construction Materials Section at Leipzig University in Germany. The conference has come at an opportune moment for concrete construction worldwide and sought to focus on an increasingly important aspect in modern infrastructure provision and retention: that of appropriately repairing, maintaining, rehabilitating, and if necessary retrofitting existing

infrastructure with a view to extending its life and maximising its economic return. The conference Proceedings contain papers, presented at the conference, and classified into a total of 15 sub themes which can be grouped under the four main themes of (i) Concrete durability aspects, (ii) Condition assessment of concrete structures, (iii) Concrete repair, rehabilitation and retrofitting, and (iv) Performance monitoring and health assessment. The major interest in terms of submissions exists in the fields of concrete durability aspects in connection with material compositions, NDE/NDT and measurement techniques, repair methods and materials, and structural strengthening and retrofitting techniques. The large number of high-quality papers presented and the wide range of relevant topics covered confirm that these Proceedings will be a valued reference for many working in the important fields of concrete durability and repair and that they form a suitable base for discussion and provide suggestions for future development and research.

Concrete Repair, Rehabilitation and Retrofitting II - Mark G. Alexander 2008-11-13

The Second International Conference on Concrete Repair, Rehabilitation and Retrofitting (ICCRRR 2005) was held in Cape Town, South Africa, from 24-26 November 2008. The Conference followed the very successful First International Conference, also in Cape Town in 2005, and continued as a collaborative venture by researchers from the South African Research Programme in Concrete Materials (based at the Universities of Cape Town and The Witwatersrand) and The Construction Materials Sections at Leipzig University and MFPA Leipzig in Germany. The background, in industry and the state of national infrastructures, continues to be highly challenging and demanding. The facts remain that much of our concrete infrastructure deteriorates at unacceptable rates, that we need appropriate tools and techniques to undertake the vast task of sound repair, maintenance and rehabilitation of such infrastructure, and that all this must be undertaken with due cognisance of the limited budgets available for such work. New ways

need to be found to extend the useful life of concrete structures cost-effectively. Confidence in concrete as a viable construction material into the 21st century needs to be retained and sustained, particularly considering the environmental challenges that the industry and society now face. The conference proceedings contain papers, presented at the conference, and classified into a total of 12 sub themes which can be grouped under the three main themes of (i) Concrete durability aspects, (ii) Condition assessment of concrete structures, and (iii) Concrete repair, rehabilitation and retrofitting. The major interests in terms of submissions exists in the fields of innovative materials for durable concrete construction, integrated service life modelling of reinforced concrete structures, NDE/NDT and measurement techniques, repair methods and materials, and structural strengthening and retrofitting techniques. The large number of high-quality papers presented and the wide range of relevant topics covered confirm that these proceedings will be a valued reference for many working in the important fields of concrete durability and repair, and that they will form a suitable base for discussion and provide suggestions for future development and research. Set of book of abstracts (476 pp) and a searchable full paper CD-ROM (1396 pp).

Size Effect in Concrete Materials and Structures - Xiuli Du 2020-12-31

The present book gathers a large amount of the recent research results on this topic to provide a better understanding of the size effect by giving a quantitative description of the relationship between the properties of engineering concrete-making material (e.g. the nominal strength) and the corresponding structure size. To be precise, this is about to explore the new static and dynamic unified size effect laws for concrete materials, as well as size effect laws for concrete components. Besides presenting clear and accurate descriptions that further deepen our fundamental knowledge, this book provides additionally useful tools for the scientific design of concrete structures in practical engineering applications.