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Testing and Characterization of Sustainable Innovative Bituminous Materials and Systems - Manfred N. Partl 2018-02-01

This book presents the detailed results of five task groups of the RILEM technical committee TC 237-SIB on Testing and Characterization of Sustainable Innovative Bituminous Materials and Systems. It concentrates on specific new topics in asphalt binder and mixture testing, dealing with new developments in asphalt testing, in particular also in view of new innovative bituminous materials, such as hot and cold recycled mixtures, grid reinforced pavements and recycled Reclaimed Asphalt Pavements (RAP), where test methods developed for traditional asphalt concrete are not a priori applicable. The main objective is providing a basis for pre-standardization by comparing different test methods and showing ways for fundamental improvements. Thus, the book also points the way for a further advanced chemo-physical understanding of materials and their role in pavement systems relying on fundamental material properties and suitable models for describing and predicting the intrinsic mechanisms that determine the material behavior.

Benchmarking Chloride Ingress Models on Real-life Case Studies—Marine Submerged and Road Sprayed Concrete Structures - Eddie Koenders 2022-05-12

This book presents the work of RILEM Technical Committee 270-CIM: Benchmarking Chloride Ingress Models on Real-life Case Studies - Theory and Practice. It provides a comparative benchmark analysis of various types of chloride ingress models with emphasis on short, medium and long-term predictions. The book is subdivided in five chapters. The first chapter is an introduction on the benchmark and selected cases. The second chapter reports theoretical backgrounds of various analytical and numerical models for chloride ingress, followed by a short description of the models employed in the benchmark analysis. Chapter three describes the benchmark results of the Marine Submerged case, and chapter 4 of the Road Sprayed case. The last chapter reports conclusions, guidelines for calibration and recommendations. The book will benefit academics, designers, engineers, consultants, but also asset owners and standardization committees interested in durability and service life assessment of concrete structures.

Self-Healing Construction Materials - Antonios Kanellopoulos 2021-12-08

This book provides a thorough overview of all techniques for producing self-healing construction materials. Construction materials (cement-based, bituminous, metals, and alloys) are prone to cracking, which with the progress of time can lead to compromising of the structural integrity of critical infrastructure. Self-healing materials form a new class of materials that have inbuilt engineered properties to counteract damage and repair it before it becomes critical. The methods for monitoring, modeling, and assessing self-healing are also reviewed. The final section of the book discusses the future outlook and potential extension of self-healing concepts to other materials (e.g., heritage structures and soils).

Testing and Characterisation of Earth-based Building Materials and Elements - Antonin Fabbri 2021-11-26

This book presents the work done by the RILEM Technical Committee 274-TCE. It focuses on the estimation of the parameters which are necessary to properly design earthen constructions. It provides a compilation of the value classically obtained for the key parameters of earthen materials, a pedagogical presentation of the main testing procedures for earthen materials, their advantage and their drawback and an overview of most standards on earthen materials, whatever their origin and their language.The book is divided into eight chapters. After a general introduction on earthen materials and constructions, the state of the art on the material characterisation technics, the assessment of hygrothermal performance, the mechanical behaviour, seismic resistance and the durability will be presented, each in a dedicated chapter. On the basis of these last chapters, a critical review of the standards which are used for earthen material will be presented in the last chapter. The last chapter is dedicated to the analysis of the environmental potential of earth-based building materials.

Environment-Friendly Construction Materials - Shaopeng Wu 2019-06-20

Construction materials are the most widely used materials for civil infrastructure in our daily lives. However, from an environmental point of view, they consume a huge amount of natural resources and generate the majority of greenhouse gasses. Therefore, many new and novel technologies for designing environmentally friendly construction materials have been developed recently. This Special Issue, “Environment-Friendly Construction Materials”, has been proposed and organized as a means to present recent developments in the field of construction materials. It covers a wide range of selected topics on construction materials.

8th RILEM International Conference on Mechanisms of Cracking and Debonding in Pavements - Armelle Chabot 2016-05-25

This book presents the latest advances in research to analyze mechanical damage and its detection in multilayer systems. The contents are linked to the Rilem TC241 - MCD scientific activities and the proceedings of the 8th RILEM International Conference on Mechanisms of Cracking and Debonding in Pavements (MCD2016). MCD2016 was hosted by Ifsttar and took place in Nantes, France, on June 7-9, 2016. In their lifetime, pavements undergo degradation due to different mechanisms of which cracking is among the most important ones. The damage and the fracture behavior of all its material layers as well as interfaces must be understood. In that field, the research activities aims to develop a deeper fundamental understanding of the mechanisms responsible for cracking and debonding in asphalt concrete and composite (e.g. asphalt overlays placed on PCC or thin cement concrete overlay placed on asphalt layer) pavement systems.

Mechanisms of Cracking and Debonding in Asphalt and Composite Pavements - William G. Buttlar 2018-05-26

Premature cracking in asphalt pavements and overlays continues to shorten pavement lifecycles and creates significant economic and environmental burden. In response, RILEM Technical Committee TC 241-MCD on Mechanisms of Cracking and Debonding in Asphalt and Composite Pavements has conducted a State-of-the-Art Review (STAR), as detailed in this comprehensive book. Cutting-edge research performed by RILEM members and their international partners is presented, along with summaries of open research

questions and recommendations for future research. This book is organized according to the theme areas of TC 241-MCD - i.e., fracture in the asphalt bulk material, interface debonding behaviour, and advanced measurement systems. This STAR is expected to serve as a long term reference for researchers and practitioners, as it contributes to a deeper fundamental understanding of the mechanisms behind cracking and debonding in asphalt concrete and composite pavement systems.

7th RILEM International Conference on Cracking in Pavements - A. Scarpas 2012-06-09

In the recent past, new materials, laboratory and in-situ testing methods and construction techniques have been introduced. In addition, modern computational techniques such as the finite element method enable the utilization of sophisticated constitutive models for realistic model-based predictions of the response of pavements. The 7th RILEM International Conference on Cracking of Pavements provided an international forum for the exchange of ideas, information and knowledge amongst experts involved in computational analysis, material production, experimental characterization, design and construction of pavements. All submitted contributions were subjected to an exhaustive refereed peer review procedure by the Scientific Committee, the Editors and a large group of international experts in the topic. On the basis of their recommendations, 129 contributions which best suited the goals and the objectives of the Conference were chosen for presentation and inclusion in the Proceedings. The strong message that emanates from the accepted contributions is that, by accounting for the idiosyncrasies of the response of pavement engineering materials, modern sophisticated constitutive models in combination with new experimental material characterization and construction techniques provide a powerful arsenal for understanding and designing against the mechanisms and the processes causing cracking and pavement response deterioration. As such they enable the adoption of truly "mechanistic" design methodologies. The papers represent the following topics: Laboratory evaluation of asphalt concrete cracking potential; Pavement cracking detection; Field investigation of pavement cracking; Pavement cracking modeling response, crack analysis and damage prediction; Performance of concrete pavements and white toppings; Fatigue cracking and damage characterization of asphalt concrete; Evaluation of the effectiveness of asphalt concrete modification; Crack growth parameters and mechanisms; Evaluation, quantification and modeling of asphalt healing properties; Reinforcement and interlayer systems for crack mitigation; Thermal and low temperature cracking of pavements; and Cracking propensity of WMA and recycled asphalts.

Design Procedures for the Use of Composites in Strengthening of Reinforced Concrete Structures - Carlo Pellegrino 2015-08-25

This book analyses the current knowledge on structural behaviour of RC elements and structures strengthened with composite materials (experimental, analytical and numerical approaches for EBR and NSM), particularly in relation to the above topics, and the comparison of the predictions of the current available codes/recommendations/guidelines with selected experimental results. The book shows possible critical issues (discrepancies, lacunae, relevant parameters, test procedures, etc.) related to current code predictions or to evaluate their reliability, in order to develop more uniform methods and basic rules for design and control of FRP strengthened RC structures. General problems/critical issues are clarified on the basis of the actual experiences, detect discrepancies in existing codes, lacunae in knowledge and, concerning these identified subjects, provide proposals for improvements. The book will help to contribute to promote and consolidate a more qualified and conscious approach towards rehabilitation and strengthening existing RC structures with composites and their possible monitoring.

Accelerated Pavement Testing to Transport Infrastructure Innovation - Armelle Chabot 2020-08-25

This volume gathers the latest advances, innovations, and applications in the field of accelerated pavement testing (APT), presented at the 6th International Conference on Accelerated Pavement Testing, in Nantes, France, in April 2022. Discussing APT, which involves rapid testing of full-scale pavement constructions for structural deterioration, the book covers topics such as APT facilities, APT of asphalt concrete and sustainable/innovative materials, APT for airfield pavements, testing of maintenance and rehabilitation solutions, testing of smart and multi-functional pavements, data analysis and modeling, monitoring and non-destructive testing, and efficient means of calibrating/developing pavement design methods. Featuring peer-reviewed contributions by leading international researchers and engineers, the book is a timely and highly relevant resource for materials scientists and engineers interested in determining the performance of pavement structures during their service life (10+ years) in a few weeks or months.

Technology and Practice of Passwords - Frank Stajano 2016-03-08

This book constitutes the thoroughly refereed post-conferenceproceedings of the 9th International Conference on Passwords, PASSWORDS2015, held in Cambridge, UK, in December 2015. The 6 revised full papers presented together with 3 revised short paperswere carefully reviewed and selected from 32 initial submissions. Thepapers are organized in topical sections on human factors, attacks, and cryptography.

Chemical Technology - Nekane Guarrotxena 2015-03-02

This collection presents a broad spectrum of chapters in the various branches of industrial chemistry, biochemistry, and materials science which demonstrate key developments in these rapidly changing fields. This book offers a valuable overview and myriad details on current chemical processes, products, and practices. The book serves a spectrum of individuals, from those who are directly involved in the chemical industry to others in related industries and activities. It provides not only the underlying science and technology for important industry sectors but also provides broad coverage of critical supporting topics. This new book: • Serves as a collection of chapters that highlights some important areas of current interest in industrial chemistry, biochemistry, and materials science • Focuses on topics with more advanced methods • Emphasizes precise mathematical development and actual experimental details • Analyzes theories to formulate and prove the physicochemical principles • Provides an up-to-date and thorough exposition of the present state of the art of complex materials • Familiarizes the reader with new aspects of the techniques used in the examination of polymers, including chemical, physicochemical, and purely physical methods of examination • Describes the types of techniques now available to the chemist and technician and discusses their capabilities, limitations, and applications

Materials and Infrastructures 1 - Jean-Michel Torrenti 2016-06-17

This volume presents the first half of a diverse collection of chapters in the field of materials and infrastructures in transport systems, which illustrate the technological and methodological innovations required to rise to the challenge of building more sustainable transport infrastructures for the future. The authors explore the potential of these sustainable solutions to improve the performance and efficiency of materials and infrastructures, with a reduced environmental impact and lower cost. Theoretical and practical case studies address a variety of topics including circular economy and sustainability, the impacts of climate change, durability, lifecycle, auscultation and the monitoring of infrastructures. This book provides transport researchers and professionals with a better understanding of the current and future trends in these innovative fields, enabling them to put into practice new technologies and methods of design and management, so that new solutions can become current practices to truly improve modern transport systems.

Functional Pavement Design - Sandra Erkens 2016-10-14

Functional Pavement Design is a collections of 186 papers from 27 different countries, which were presented at the 4th Chinese-European Workshops (CEW) on Functional Pavement Design (Delft, the Netherlands, 29 June-1 July 2016). The focus of the CEW series is on field tests, laboratory test methods and advanced analysis techniques, and cover analysis, material development and production, experimental characterization, design and construction of pavements. The main areas covered by the book include: - Flexible pavements - Pavement and bitumen - Pavement performance and LCCA - Pavement structures - Pavements and environment - Pavements and innovation - Rigid pavements - Safety - Traffic engineering Functional Pavement Design is for contributing to the establishment of a new generation of pavement design methodologies in which rational mechanics principles, advanced constitutive models and advanced material characterization techniques shall constitute the backbone of the design process. The book will be much of interest to professionals and academics in pavement engineering and related disciplines.

Eleventh International Conference on the Bearing Capacity of Roads, Railways and Airfields - Inge Hoff 2022-07-07

Innovations in Road, Railway and Airfield Bearing Capacity – Volume 3 comprises the third part of contributions to the 11th International Conference on Bearing Capacity of Roads, Railways and Airfields (2022). In anticipation of the event, it unveils state-of-the-art information and research on the latest policies, traffic loading measurements, in-situ measurements and condition surveys, functional testing,

deflection measurement evaluation, structural performance prediction for pavements and tracks, new construction and rehabilitation design systems, frost affected areas, drainage and environmental effects, reinforcement, traditional and recycled materials, full scale testing and on case histories of road, railways and airfields. This edited work is intended for a global audience of road, railway and airfield engineers, researchers and consultants, as well as building and maintenance companies looking to further upgrade their practices in the field.

Sustainable Construction Materials - Ravindra K. Dhir OBE 2019-01-05

Sustainable Construction Materials: Recycled Aggregate focuses on the massive systematic need that is necessary to encourage the uptake of recycled and secondary materials (RSM) in the construction industry. This book is the fifth and the last of the series on sustainable construction materials and like the previous four, it is also different to the norm. Its uniqueness lies in using the newly developed, Analytical Systemisation Method, in building the data-matrix sourced from 1413 publications, contributed by 2213 authors from 965 institutions in 67 countries, from 1977 to 2018, on the subject of recycled aggregate as a construction material, and systematically analysing, evaluating and modelling this information for use of the material as an aggregate concrete and mortar, geotechnics and road pavement applications. Environmental issues, case studies and standards are also discussed. The work establishes what is already known and can be used to further progress the use of sustainable construction materials. It can also help to avoid repetitive research and save valuable resources. The book is structured in an incisive and easy to digest manner and is particularly suited for researchers, academics, design engineers, specifiers, contractors, and government bodies dealing with construction works. Provides an exhaustive and comprehensively organized list of globally-based published literature spanning 5000 references Offers an analysis, evaluation, repackaging and modeling of existing knowledge that encourages more responsible use of waste materials Provides a wealth of knowledge for use in many sectors relating to the construction profession, including academia, research, practice and adoption of RSM

RILEM Recommendations for the Prevention of Damage by Alkali-Aggregate Reactions in New Concrete Structures - Philip J. Nixon 2015-09-30

This book contains the full set of RILEM Recommendations which have been produced to enable engineers, specifiers and testing houses to design and produce concrete which will not suffer damage arising from alkali reactions in the concrete. There are five recommended test methods for aggregates (designated AAR-1 to AAR-5), and an overall recommendation which describes how these should be used to enable a comprehensive aggregate assessment (AAR-0). Additionally, there are two Recommended International Specifications for concrete (AAR-7.1 & 7.2) and a Preliminary International Specification for dams and other hydro structures (AAR-7.3), which describe how the aggregate assessment can be combined with other measures in the design of the concrete to produce a concrete with a minimised risk of developing damage from alkali-aggregate reactions.

Bituminous Mixtures and Pavements VII - A.F. Nikolaides 2019-05-24

Highway engineers are facing the challenge not only to design and construct sustainable and safe pavements properly and economically. This implies a thorough understanding of materials behaviour, their appropriate use in the continuously changing environment, and implementation of constantly improved technologies and methodologies. Bituminous Mixtures and Pavements VII contains more than 100 contributions that were presented at the 7th International Conference 'Bituminous Mixtures and Pavements' (7ICONFBMP, Thessaloniki, Greece 12-14 June 2019). The papers cover a wide range of topics: - Bituminous binders - Aggregates, unbound layers and subgrade - Bituminous mixtures (Hot, Warm and Cold) - Pavements (Design, Construction, Maintenance, Sustainability, Energy and environment consideration) - Pavement management - Pavement recycling - Geosynthetics - Pavement assessment, surface characteristics and safety - Posters Bituminous Mixtures and Pavements VII reflects recent advances in highway materials technology and pavement engineering, and will be of interest to academics and professionals interested or involved in these areas.

Digital Fabrication with Cement-Based Materials - Nicolas Roussel 2022-01-12

This book presents the work of the RILEM Technical Committee 276-DFC: Digital fabrication with cement-based materials. The most important outcomes of the technical committee are presented. First, a unified process classification for digital fabrication with concrete is proposed, discussed and illustrated. Then, a state of the art of the testing methods (both at a material and structural level and in the fresh and hardened state) is provided. The gathered knowledge is expected to form the foundation of some quality control procedures for fresh properties along with hardened properties and service life performance. The book will benefit academics, practitioners, industry and standardization committees interested in digital fabrication with cement-based materials.

Performance Assessment of Concrete Structures and Engineered Barriers for Nuclear Applications - Valérie L'Hostis 2016-09-06

The main outcomes of RILEM TC-226-CNM are summarized in this book. Key input was provided by researchers from countries that are main contributors in the R&D, design, construction, operation, and regulation of waste nuclear reinforced concrete facilities. Nuclear power plants and many of the facilities and structures used for the management of radioactive waste materials generated by the fuel cycle use concrete in their construction. RILEM TC 226 CNM covered several areas including functional and performance requirements for concrete structures; degradation processes; phenomenological modelling, field experiences, tests approaches, instrumentation and monitoring methods dedicated to performance assessments; service-life models; aging Management of Nuclear Power Plants, repair techniques; codes and standards specific to radioactive waste facilities.

Bearing Capacity of Roads, Railways and Airfields - Andreas Loizos 2017-07-20

Bearing Capacity of Roads, Railways and Airfields includes the contributions to the 10th International Conference on the Bearing Capacity of Roads, Railways and Airfields (BCRRA 2017, 28-30 June 2017, Athens, Greece). The papers cover aspects related to materials, laboratory testing, design, construction, maintenance and management systems of transport infrastructure, and focus on roads, railways and airfields. Additional aspects that concern new materials and characterization, alternative rehabilitation techniques, technological advances as well as pavement and railway track substructure sustainability are included. The contributions discuss new concepts and innovative solutions, and are concentrated but not limited on the following topics: · Unbound aggregate materials and soil properties · Bound materials characteritics, mechanical properties and testing · Effect of traffic loading · In-situ measurements techniques and monitoring · Structural evaluation · Pavement serviceability condition · Rehabilitation and maintenance issues · Geophysical assessment · Stabilization and reinforcement · Performance modeling · Environmental challenges · Life cycle assessment and sustainability Bearing Capacity of Roads, Railways and Airfields is essential reading for academics and professionals involved or interested in transport infrastructure systems, in particular roads, railways and airfields.

Reflective Cracking in Pavements - L. Francken 1996-09-26

Proceedings of RILEM TC-PRC third conference on this subject. Papers from road authorities, engineers, researchers, contractors and manufacturers discussing the implementation and the long term behaviour of overlay systems. The following topics are covered: prevention and cracking assessment, choice and design of overlay systems, practical implementation, case histories and long term performance.

Green and Intelligent Technologies for Sustainable and Smart Asphalt Pavements - Xueyan Liu 2021-11-25

Green and Intelligent Technologies for Sustainable and Smart Asphalt Pavements contains 124 papers from 14 different countries which were presented at the 5th International Symposium on Frontiers of Road and Airport Engineering (IFRAE 2021, Delft, the Netherlands, 12-14 July 2021). The contributions focus on research in the areas of "Circular, Sustainable and Smart Airport and Highway Pavement" and collects the state-of-the-art and state-of-practice areas of long-life and circular materials for sustainable, cost-effective smart airport and highway pavement design and construction. The main areas covered by the book include: • Green and sustainable pavement materials • Recycling technology • Warm & cold mix asphalt materials • Functional pavement design • Self-healing pavement materials • Eco-efficiency pavement materials • Pavement preservation, maintenance and rehabilitation • Smart pavement materials and structures • Safety technology for smart roads • Pavement monitoring and big data analysis • Role of transportation engineering in future pavements Green and Intelligent Technologies for Sustainable and Smart Asphalt Pavements aims at researchers, practitioners, and administrators interested in new materials and

innovative technologies for achieving sustainable and renewable pavement materials and design methods, and for those involved or working in the broader field of pavement engineering.

A Framework for Durability Design with Strain-Hardening Cement-Based Composites (SHCC) - Gideon P.A.G. van Zijl 2017-01-05

This book captures the state of the art of the durability of fibre-reinforced strain-hardening cement-based composites (SHCC) and the durability of structures or structural elements manufactured in full or in part with this class of modern construction materials. Highlights include: - Reflection on durability performance of existing applications in patch repair, a water reservoir and highway bridges. - Guidelines for tensile testing towards durability assessment of cracked SHCC. - New crack pattern related ingress rate indices for water and chloride into cracked SHCC. - The influence of low and high temperatures on SHCC durability performance. - The mechanism of crack control reducing ASR and corrosion rate, and results on chloride-induced corrosion of embedded steel reinforcement. - Self-healing of cracks in SHCC. - A conceptual durability design framework for SHCC and R/SHCC structures and members.

Bituminous Mixtures and Pavements VI - A. Nikolaides 2015-07-28

Bituminous Mixtures and Pavements contains 113 accepted papers from the 6th International ConferenceBituminous Mixtures and Pavements (6th ICONFBMP, Thessaloniki, Greece, 10-12 June 2015). The 6th ICONFBMP is organized every four years by the Highway Engineering Laboratory of the Aristotle University of Thessaloniki, Greece, in conjunction with

Asphalt Paving Technology 2015 - Eugene Skok 2016-02-16

Recent research on asphalt binder aging and rejuvenatorsKey data on asphalt performance and formulationsUpdates on tests and specificationsFully-searchable text on CD-ROM (included) This series volume comprises research papers and technical reports developed within the U.S.-based Association of Asphalt Paving Technologists. The book is divided into sessions focused on technology, specifications, cold recycling of RAP, and rejuvenators, with special emphasis on aging and on how rejuvenators are modeled, formulated and used to improve asphalt binders and prevent cracking. The CD-ROM displays figures and illustrations in articles in full color along with a title screen and main menu screen. Each user can link to all papers from the Table of Contents and Author Index and also link to papers and front matter by using the global bookmarks which allow navigation of the entire CD-ROM from every article. Search features on the CD-ROM can be by full text including all key words, article title, author name, and session title. The CD-ROM has Autorun feature for Windows 2000 with Service Pack 4 or higher products along with the program for Adobe Acrobat Reader with Search 11.0. One year of technical support is included with your purchase of this product.

7th RILEM International Conference on Cracking in Pavements - A. Scarpas 2012-08-30

In the recent past, new materials, laboratory and in-situ testing methods and construction techniques have been introduced. In addition, modern computational techniques such as the finite element method enable the utilization of sophisticated constitutive models for realistic model-based predictions of the response of pavements. The 7th RILEM International Conference on Cracking of Pavements provided an international forum for the exchange of ideas, information and knowledge amongst experts involved in computational analysis, material production, experimental characterization, design and construction of pavements. All submitted contributions were subjected to an exhaustive refereed peer review procedure by the Scientific Committee, the Editors and a large group of international experts in the topic. On the basis of their recommendations, 129 contributions which best suited the goals and the objectives of the Conference were chosen for presentation and inclusion in the Proceedings. The strong message that emanates from the accepted contributions is that, by accounting for the idiosyncrasies of the response of pavement engineering materials, modern sophisticated constitutive models in combination with new experimental material characterization and construction techniques provide a powerful arsenal for understanding and designing against the mechanisms and the processes causing cracking and pavement response deterioration. As such they enable the adoption of truly "mechanistic" design methodologies. The papers represent the following topics: Laboratory evaluation of asphalt concrete cracking potential; Pavement cracking detection; Field investigation of pavement cracking; Pavement cracking modeling response, crack analysis and damage prediction; Performance of concrete pavements and white toppings; Fatigue cracking and damage characterization of asphalt concrete; Evaluation of the effectiveness of asphalt concrete modification; Crack growth parameters and mechanisms; Evaluation, quantification and modeling of asphalt healing properties; Reinforcement and interlayer systems for crack mitigation; Thermal and low temperature cracking of pavements; and Cracking propensity of WMA and recycled asphalts.

Innovative AE and NDT Techniques for On-Site Measurement of Concrete and Masonry Structures - Masayasu Ohtsu 2016-05-26

The research and its outcomes presented in this book treat applications of NDT techniques to on-site measurements. These on-site measurements have been marginally successful as each technique requires a particular analysis. In this regard, visualization and imaging of results are in great demand for practitioners and engineers for inspection. This volume, in which on-site measurements of concrete and masonry structures by NDT techniques are comprehensively summarized, focuses on the visualization procedure of the results measured. The book will therefore be of great value to the field.

Proceedings of the 5th International Symposium on Asphalt Pavements & Environment (APE) - Marco Pasetto 2019-08-29

This volume highlights the latest advances, innovations, and applications in the field of asphalt pavement technology, as presented by leading international researchers and engineers at the 5th International Symposium on Asphalt Pavements & Environment (ISAP 2019 APE Symposium), held in Padua, Italy on September 11-13, 2019. It covers a diverse range of topics concerning materials and technologies for asphalt pavements, designed for sustainability and environmental compatibility: sustainable pavement materials, marginal materials for asphalt pavements, pavement structures, testing methods and performance, maintenance and management methods, urban heat island mitigation, energy harvesting, and Life Cycle Assessment. 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.

Bio-aggregates Based Building Materials - Sofiane Amziane 2017-02-04

The work of the RILEM Technical Committee (TC -236 BBM) was dedicated to the study of construction materials made from plant particles. It considered the question whether building materials containing as main raw material recyclable and easily available plant particles are renewable. This book includes a state-of-the-art report and an appendix. The state-of-the-art report relates to the description of vegetal aggregates. Then, hygrothermal properties, fire resistance, durability and finally the impact of the variability of the method of production of bio-based concrete are assessed. The appendix is a TC report which presents the experience of a working group. The goal was to define testing methods for the measurement of water absorption, bulk density, particle size distribution, and thermal conductivity of bio aggregates. The work is based on a first round robin test of the TC-BBM where the protocols in use by the different laboratories (labs) are compared. p>

Proceedings of the RILEM International Symposium on Bituminous Materials - Hervé Di Benedetto 2021-09-25

This volume highlights the latest advances, innovations, and applications in bituminous materials and structures and asphalt pavement technology, as presented by leading international researchers and engineers at the RILEM International Symposium on Bituminous Materials (ISBM), held in Lyon, France on December 14-16, 2020. The symposium represents a joint effort of three RILEM Technical Committees from Cluster F: 264-RAP “Asphalt Pavement Recycling”, 272-PIM “Phase and Interphase Behaviour of Bituminous Materials”, and 278-CHA “Crack-Healing of Asphalt Pavement Materials”. It covers a diverse range of topics concerning bituminous materials (bitumen, mastics, mixtures) and road, railway and airport pavement structures, including: recycling, phase and interphase behaviour, cracking and healing, modification and innovative materials, durability and environmental aspects, testing and modelling, multi-scale properties, surface characteristics, structure performance, modelling and design, non-destructive testing, back-analysis, and Life Cycle Assessment. 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 new multidisciplinary collaborations.

8th RILEM International Symposium on Testing and Characterization of Sustainable and

Innovative Bituminous Materials - Francesco Canestrari 2015-09-24
This work presents the results of RILEM TC 237-SIB (Testing and characterization of sustainable innovative bituminous materials and systems). The papers have been selected for publication after a rigorous peer review process and will be an invaluable source to outline and clarify the main directions of present and future research and standardization for bituminous materials and pavements. The following topics are covered: - Characterization of binder-aggregate interaction - Innovative testing of bituminous binders, additives and modifiers - Durability and aging of asphalt pavements - Mixture design and compaction analysis - Environmentally sustainable materials and technologies - Advances in laboratory characterization of bituminous materials - Modeling of road materials and pavement performance prediction - Field measurement and in-situ characterization - Innovative materials for reinforcement and interlayer systems - Cracking and damage characterization of asphalt pavements - Recycling and re-use in road pavements This is the proceedings of the RILEM SIB2015 Symposium (Ancona, Italy, October 7-9, 2015).
Advances in Materials and Pavement Performance Prediction II - K. Anupam 2020-12-08
Inspired from the legacy of the previous four 3DFEM conferences held in Delft and Athens as well as the successful 2018 AM3P conference held in Doha, the 2020 AM3P conference continues the pavement mechanics theme including pavement models, experimental methods to estimate model parameters, and their implementation in predicting pavement performance. The AM3P conference is organized by the Standing International Advisory Committee (SIAC), at the time of this publication chaired by Professors Tom Scarpas, Eyad Masad, and Amit Bhasin. Advances in Materials and Pavement Performance Prediction II includes over 111 papers presented at the 2020 AM3P Conference. The technical topics covered include: - rigid pavements - pavement geotechnics - statistical and data tools in pavement engineering - pavement structures - asphalt mixtures - asphalt binders The book will be invaluable to academics and engineers involved or interested in pavement engineering, pavement models, experimental methods to estimate model parameters, and their implementation in predicting pavement performance.
Introduction to Unmanned Aircraft Systems, Second Edition - Douglas M. Marshall 2015-10-26
The proliferation of technological capability, miniaturization, and demand for aerial intelligence is pushing unmanned aerial systems (UAS) into the realm of a multi-billion dollar industry. This book surveys the UAS landscape from history to future applications. It discusses commercial applications, integration into the national airspace system (NAS), System function, operational procedures, safety concerns, and a host of other relevant topics. The book is dynamic and well-illustrated with separate sections for terminology and web- based resources for further information.
Simulation of Fresh Concrete Flow - Nicolas Roussel 2014-03-26
This work deals with numerical simulations of fresh concrete flows. After the first introductory chapter dealing with the various physical phenomena involved in flows of fresh cementitious materials, the aim of the second chapter is to give an overview of the work carried out on simulation of flow of cement-based materials using computational fluid dynamics (CFD). This includes governing equations, constitutive equations, analytical and numerical solutions, and examples showing simulations of testing, mixing and castings. The third chapter focuses on the application of Discrete Element Method (DEM) in simulating the flow of fresh concrete. The fourth chapter is an introductory text about numerical errors both in CFD and DEM whereas the fifth and last chapter give some recent examples of numerical simulations developed by various authors in order to simulate the presence of grains or fibers in a non-Newtonian cement matrix.
Performance-Based Specifications and Control of Concrete Durability - Hans Beushausen 2015-09-24
This work gives an overview of significant research from recent years concerning performance-based design and quality control for concrete durability and its implementation. In engineering practice, performance approaches are often still used in combination with prescriptive requirements. This is largely because, for most durability test methods, sufficient practical experience still has to be gained before engineers and owners are prepared to fully rely on them. This book, compiled by RILEM TC 230-PSC, is intended to assist efforts to successfully build the foundation for the full implementation of performance-based approaches through the exchange of relevant knowledge and experience between researchers and practitioners worldwide.
Mechanical Properties of Self-Compacting Concrete - Kamal H. Khayat 2014-02-05
The State-of-the-Art Report of RILEM Technical Committee 228-MPS on Mechanical properties of Self-Compacting Concrete (SCC) summarizes an extensive body of information related to mechanical properties and mechanical behaviour of SCC. Due attention is given to the fact that the composition of SCC varies significantly. A wide range of mechanical properties are considered, including compressive strength, stress-strain relationship, tensile and flexural strengths, modulus of elasticity, shear strength, effect of elevated temperature, such as fire spalling and residual properties after fire, in-situ properties, creep, shrinkage, bond properties and structural behaviour. A chapter on fibre-reinforced SCC is included, as well as a chapter on specialty SCC, such as light-weight SCC, heavy-weight SCC, preplaced aggregate SCC, special fibre reinforced SCC and underwater concrete.
Thermal Cracking of Massive Concrete Structures - Eduardo M.R. Fairbairn 2018-05-23
This book provides a State of the Art Report (STAR) produced by RILEM Technical Committee 254-CMS ‘Thermal Cracking of Mas-sive Concrete Structures’. Several recent developments related to the old problem of understanding/predicting stresses originated from the evolution of the hydration of concrete are at the origin of the creation this technical committee. Having identified a lack in the organization of up-to-date scientific and technological knowledge about cracking induced by hydration heat effects, this STAR aims to provide both practitioners and scientists with a deep integrated overview of consolidated knowledge, together with recent developments on this subject.
Diagnosis & Prognosis of AAR Affected Structures - Victor E. Saouma 2020-09-21
This book presents the work of the RILEM Technical Committee 259-ISR. Addressing two complementary but fundamental issues: the kinetics of the reaction, and how this will affect the integrity of the structure (serviceability and strength), it also provides methodology for assessing past deterioration to enable readers to make engineering/science-based predictions concerning future expansion. The book is divided into six major topics: selection and interpretation of optimal monitoring system for structures undergoing expansion to monitor the progress of the swelling evolution and its consequences; development/refinement of current laboratory procedures to determine the kinetics of the reaction i.e. expansion vs (future) time, and to determine the kinetic characteristics of the time-dependent reaction to be used in a finite element simulation; extrapolation of results from structural component laboratory testing; selection of material properties based on data from existing structures affected by the alkali silica reaction or delayed ettringite formation; identification of critical features that should be present in a finite element code, development of test problems for validation, and a survey of relevant programs able to conduct a transient structural analysis of a structure undergoing chemically induced expansion; and lastly guidelines for finite element codes. The book is intended for practitioners responsible for concrete structures affected by the damaging alkali aggregate reaction, engineers dealing with aging structures, and researchers in the field.
2021 6th International Conference on Intelligent Transportation Engineering (ICITE 2021) - Zhenyuan Zhang 2022-05-31
This book features high-quality, peer-reviewed papers from the 2021 6th International Conference on Intelligent Transportation Engineering (ICITE 2021), held in Beijing, China, on October 29–31, 2021. Presenting the latest developments and technical solutions in Intelligent Transportation engineering, it covers a variety of topics, such as intelligent transportation, traffic control, road networking, intelligent automobile and vehicle operation & management. The book will be a valuable reference for graduate and postgraduate audiences, researchers and engineers, working in Intelligent Transportation Engineering.