

Failure Distress And Repair Of Concrete Structures Woodhead Publishing Series In Civil And Structural Engineering

This synthesis report will be of special interest to pavement engineers and pavement construction and maintenance personnel responsible for portland cement concrete (PCC) pavement joints. Still pertinent information from NCHRP Synthesis 19 (1973), as well as new or updated information in the areas of joint design, construction, and maintenance are included. This report of the Transportation Research Board records the state of the practice with respect to the design, construction, and maintenance of PCC pavement joints. In addition, information on joint materials and sealing, the control of water on and in pavements, and the evaluation of pavement joint performance is provided.

Eco-efficient Repair and Rehabilitation of Concrete Infrastructures provides an updated state-of-the-art review on eco-efficient repair and rehabilitation of concrete infrastructure. The first section focuses on deterioration assessment methods, and includes chapters on stress wave assessment, ground-penetrating radar, monitoring of corrosion, SHM using acoustic emission and optical fiber sensors. Other sections discuss the development and application of several new innovative repair and rehabilitation materials, including geopolymers, sulfoaluminate cement-based concrete, engineered cementitious composites (ECC) based concrete, bacteria-based concrete, concrete with encapsulated polyurethane, and concrete with super absorbent polymer (SAPs), amongst other topics. Final sections focus on crucial design aspects, such as quality control, including lifecycle and cost analysis with several related case studies on repair and rehabilitation. The book will be an essential reference resource for materials scientists, civil and structural engineers, architects, structural designers and contractors working in the construction industry. Delivers the latest research findings with contributions from leading international experts Provides fully updated information on the European standard on materials for concrete repair (EN 1504) Includes an entire sections on the state-of-the-art in NDT, innovative repair and rehabilitation materials, as well as LCC and LCA information

For practising civil and structural engineers in the field of general earth-retaining structure theory, this work presents the results of many case studies of actual retaining wall analysis, design, and construction. It also includes fundamental papers dealing with the effects of groundwater on passive earth pressure, and other related topics.

This manual provides guidance on evaluating the condition of the concrete in a structure, relating the condition of the concrete to the underlying cause or causes of that condition, selecting an appropriate repair material and method for any deficiency found, and using the selected materials and methods to repair or rehabilitate the structure. Guidance is also included on maintenance of concrete and on preparation of concrete investigation reports for repair and rehabilitation projects. Considerations for certain specialized types of rehabilitation projects are also given.

This book, through a bunch of systematic and analytical notes and scientific commentaries, acquaints the readers with the

innovative methods of regional development, measurement of the development in regional scale, regional development models, and policy prescriptions. Conceptualizing development as a regional process is a geographer's brainchild, and the sense of region has long been rooted deeply in the fundamental research practices that geographers are accustomed to. The geographical perspective of regions entails conceptualizing them nested horizontally as the formal region and hierarchical relationships in space with spatial flows or interactions as the functional region. In geographical research, the region works as a tool by serving as a statistical unit of analysis. More importantly, however, regions serve as the fundamental spatial units of management and planning by specifying a territory or a part of it for which a certain spatial development or regulatory plan is sought. This book addresses the complex processes in different regions of the world, particularly South Asia, to perceive the regional development planning involved and the sustainable management practiced there. The book is a useful resource for socio-economic planners, policymakers, and policy researchers.

Engineers have a range of sophisticated techniques at their disposal to evaluate the condition of reinforced concrete structures and non-destructive evaluation plays a key part in assessing and prioritising where money should be spent on repair or replacement of structurally deficient reinforced concrete structures. Non-destructive evaluation of reinforced concrete structures, Volume 2: Non-destructive testing methods reviews the latest non-destructive testing techniques for reinforced concrete structures and how they are used. Part one discusses planning and implementing non-destructive testing of reinforced concrete structures with chapters on non-destructive testing methods for building diagnosis, development of automated NDE systems, structural health monitoring systems and data fusion. Part two reviews individual non-destructive testing techniques including wireless monitoring, electromagnetic and acoustic-elastic waves, laser-induced breakdown spectroscopy, acoustic emission evaluation, magnetic flux leakage, electrical resistivity, capacitometry, measuring the corrosion rate (polarization resistance) and the corrosion potential of reinforced concrete structures, ground penetrating radar, radar tomography, active thermography, nuclear magnetic resonance imaging, stress wave propagation, impact-echo, surface and guided wave techniques and ultrasonics. Part three covers case studies including inspection of concrete retaining walls using ground penetrating radar, acoustic emission and impact echo techniques and using ground penetrating radar to assess an eight-span post-tensioned viaduct. With its distinguished editor and international team of contributors, Non-destructive evaluation of reinforced concrete structures, Volume 2: Non-destructive testing methods is a standard reference for civil and structural engineers as well as those concerned with making decisions regarding the safety of reinforced concrete structures. Reviews the latest non-destructive testing (NDT) techniques and how they are used in practice Explores the process of planning a non-destructive program features strategies for the application of NDT testing A specific section outlines significant advances in individual NDT techniques and features wireless monitoring and electromagnetic and acoustic-elastic wave technology

Understanding and recognising failure mechanisms in concrete is a fundamental pre-requisite to determining the type of repair, or whether a repair is feasible. This title provides a review of concrete deterioration and damage, as well as

looking at the problem of defects in concrete. It also discusses condition assessment and repair techniques. Part one discusses failure mechanisms in concrete and covers topics such as causes and mechanisms of deterioration in reinforced concrete, types of damage in concrete structures, types and causes of cracking and condition assessment of concrete structures. Part two reviews the repair of concrete structures with coverage of themes such as standards and guidelines for repairing concrete structures, methods of crack repair, repair materials, bonded concrete overlays, repairing and retrofitting concrete structures with fiber-reinforced polymers, patching deteriorated concrete structures and durability of repaired concrete. With its distinguished editor and international team of contributors, Failure and repair of concrete structures is a standard reference for civil engineers, architects and anyone working in the construction sector, as well as those concerned with ensuring the safety of concrete structures. Provides a review of concrete deterioration and damage Discusses condition assessment and repair techniques, standards and guidelines

The First International Conference on Concrete Repair, Rehabilitation and Retrofitting (ICCRRR 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.

Textile Fibre Composites in Civil Engineering provides a state-of-the-art review from leading experts on recent developments, the use of textile fiber composites in civil engineering, and a focus on both new and existing structures. Textile-based composites are new materials for civil engineers. Recent developments have demonstrated their potential

in the prefabrication of concrete structures and as a tool for both strengthening and seismic retrofitting of existing concrete and masonry structures, including those of a historical value. The book reviews materials, production technologies, fundamental properties, testing, design aspects, applications, and directions for future research and developments. Following the opening introductory chapter, Part One covers materials, production technologies, and the manufacturing of textile fiber composites for structural and civil engineering. Part Two moves on to review testing, mechanical behavior, and durability aspects of textile fiber composites used in structural and civil engineering. Chapters here cover topics such as the durability of structural elements and bond aspects in textile fiber composites. Part Three analyzes the structural behavior and design of textile reinforced concrete. This section includes a number of case studies providing thorough coverage of the topic. The final section of the volume details the strengthening and seismic retrofitting of existing structures. Chapters investigate concrete and masonry structures, in addition to providing information and insights on future directions in the field. The book is a key volume for researchers, academics, practitioners, and students working in civil and structural engineering and those working with advanced construction materials. Details the range of materials and production technologies used in textile fiber composites Analyzes the durability of textile fiber composites, including case studies into the structural behavior of textile reinforced concrete Reviews the processes involved in strengthening existing concrete structures

Prepared by the Highway Innovative Technology Evaluation Center (HITEC), a CERF Service Center. The report describes a HITEC evaluation of Bondade CU-31 Bonding Solution, manufactured by Transpo Industries. The report describes a three-year program of field testing and evaluation designed to determine the effectiveness of Bondade CU-31 in extending the service life of pothole repairs.

"Mechanically stabilized earth (MSE) walls are an important class of infrastructure assets whose long-term performance depends on various factors. As with most all other classes of assets, MSE walls need periodic inspection and assessment of performance. To date, some agencies have established MSE wall monitoring programs, whereas others are looking for guidance, tools, and funding to establish their own monitoring programs. The objective of this synthesis project is to determine how transportation agencies monitor, assess, and predict the long-term performance of MSE walls. The information used to develop this synthesis came from a literature review together with a survey and interviews. Of the 52 U.S. and 12 Canadian targeted survey recipients, 39 and five, respectively, responded. This synthesis reveals that unlike bridges and pavements, MSE walls and retaining walls in general are often overlooked as assets. Fewer than one-quarter of state-level transportation agencies in the United States have developed some type of MSE wall inventory beyond that which may be captured as part of their bridge inventories. Fewer still have the methods and means to

populate their inventories with data from ongoing inspections from which assessments of wall performance can be made. In the United States, there is no widely used, consistently applied system for managing MSE walls. Wall inventory and monitoring practices vary between agencies. This synthesis examines existing practices concerning the nature, scope, and extent of existing MSE wall inventories. It also examines the collection of MSE wall data, including the types of performance data collected, how they are maintained in wall inventories and databases, the frequency of inventory activities, and assessment practices relevant to reinforcement corrosion and degradation. Later parts of this synthesis discuss how MSE wall performance data are assessed, interpreted, and used in asset management decisions. This synthesis finds that the most well-implemented wall inventory and assessment system in the United States is the Wall Inventory Program developed by FHWA for the National Park Service. However, this system, like some others, uses 'condition narratives' in a process that can be somewhat cumbersome and subjective. Other systems use more direct numeric scales to describe wall conditions, and an advantage of such systems is that they are often compatible with those used in assessments of bridges. As experience with MSE walls accumulates, agencies will likely continue to develop, refine, and better calibrate procedures affecting design, construction, condition assessment, and asset management decisions. One portion of this synthesis is dedicated to summarizing the actions taken thus far by survey respondents to improve the long-term performance of their MSE walls. Many agencies prescribe the use of a pre-approved wall design and/or wall supplier. Other actions or policies frequently focus on drainage-related issues."--Summary.

Reviews AF runway paving material stress problems and proposed hardening program.

Biodegradation and Biodeterioration at the Nanoscale describes the biodegradation and biodeterioration of materials in the presence of nanomaterials. The book's chapters focus on the basic principles, action mechanisms and promising applications of advanced nanomaterials, along with their integration with biotechnological processes for controlled degradation and deterioration of materials. In addition, the current research indications, positive or negative environmental impacts, legislation and future directions are also discussed. This book is an important reference source for researchers, engineers and scientists working in environmental remediation, biotechnology, materials science, corrosion and nanotechnology. Provides detailed coverage on how nano-biomaterials degrade and deteriorate Compares how different types of bionanomaterials decompose Explains how the priorities of bionanomaterials affect their deterioration rate

Asphalt Pavements provides the know-how behind the design, production and maintenance of asphalt pavements and parking lots. Incorporating the latest technology, this book is the first to focus primarily on the design, production and

maintenance of low-volume roads and parking areas. Special attention is given to determining the traffic capacity, required thickness and asphalt mixture type for parking applications. Topics covered include: material information such as binder properties, testing grading and selection; construction information such as mixing plant operation, proportioning, mixture placement and compaction; and design information such as thickness and mixture design methods and guidelines on applying these to highways, city streets and parking Areas. It is an essential practical guide aimed at those engineers and architects who are not directly involved in the asphalt industry, but who nonetheless need to have a good general knowledge of the subject. Asphalt Pavements provides a novice with enough information to completely design, construct and specify an asphalt pavement.

Smart Buildings: Advanced Materials and Nanotechnology to Improve Energy Efficiency and Environmental Performance presents a thorough analysis of the latest advancements in construction materials and building design that are applied to maximize building efficiency in both new and existing buildings. After a brief introduction on the issues concerning the design process in the third millennium, Part One examines the differences between Zero Energy, Green, and Smart Buildings, with particular emphasis placed on the issue of smart buildings and smart housing, mainly the 'envelope' and how to make it more adaptive with the new possibilities offered by nanotechnology and smart materials. Part Two focuses on the last generation of solutions for smart thermal insulation. Based on the results of extensive research into more innovative insulation materials, chapters discuss achievements in nanotechnology, bio-ecological, and phase-change materials. The technical characteristics, performance level, and methods of use for each are described in detail, as are the achievements in the field of green walls and their use as a solution for upgrading the energy efficiency and environmental performance of existing buildings. Finally, Part Three reviews current research on smart windows, with the assumption that transparent surfaces represent the most critical element in the energy balance of the building. Chapters provide an extensive review on the technical features of transparent closures that are currently on the market or under development, from so-called dynamic glazing to bio-adaptive and photovoltaic glazing. The aesthetic potential and performance limits are also be discussed. Presents valuable definitions that are given to explain the characteristics, requirements, and differences between 'zero energy', 'green' and 'smart' buildings Contains particular focus on the next generation of construction materials and the most advanced products currently entering the market Lists both the advantages and disadvantages to help the reader choose the most suitable solution Takes into consideration both design and materials aspects Promotes the existence of new advanced materials providing technical information to encourage further use and reduce costs compared to more traditional materials

This book provides guidance on appraisal and repair of reinforced concrete building structures. It addresses the problems

related to reinforced concrete, corrosion of reinforcement, cracking, cathodic protection and protective coatings, and it highlights the advantages and/or problems of each while explaining the methods and options available.

Nonconventional and Vernacular Construction Materials: Characterisation, Properties and Applications provides a comprehensive repository of information on materials science and the modern structural engineering application of ancient, vernacular, and nonconventional building materials, with leading experts contributing chapters that focus on current applications and the engineering of these construction materials. Opening with a historic retrospective of nonconventional materials, Part One includes a review of vernacular construction and a discussion of the future directions for nonconventional and vernacular materials research and applications. Chapters in Part Two focus on natural fibers, including their application in cementitious composites, non-cementitious composites, and strawbale construction. In Part Three, chapters cover the use of industrial by-products and natural ashes in cement mortar and concrete, and construction using soil-cement blocks, clay-based materials, adobe and earthen materials, and ancient stone masonry. Timber, bamboo, and paper construction materials are investigated in the final section of the book. Provides a state-of-the-art review of the modern use and engineering of nonconventional building materials Contains chapters that focus on individual construction materials and address both material characterization and structural applications Covers sustainable engineering and the trend towards engineering for humanity

Characteristics and Uses of Steel Slag in Building Construction focuses predominantly on the utilization of ferrous slag (blast furnace and steel slag) in building construction. This extensive literature review discusses the worldwide utilization of ferrous slag and applications in all sectors of civil engineering, including structural engineering, road construction, and hydro-technical structures. It presents cutting-edge research on the characteristics and properties of ferrous slag, and its overall impact on the environment. Comprehensively reviews the literature on the use of blast furnace and steel slag in civil engineering Examines the environmental impact of slag production and its effect on human health Presents cutting-edge research from worldwide studies on the use of blast furnace and steel slag

The use of fiber-reinforced polymer (FRP) composite materials has had a dramatic impact on civil engineering techniques over the past three decades. FRPs are an ideal material for structural applications where high strength-to-weight and stiffness-to-weight ratios are required. **Developments in fiber-reinforced polymer (FRP) composites for civil engineering** outlines the latest developments in fiber-reinforced polymer (FRP) composites and their applications in civil engineering. Part one outlines the general developments of fiber-reinforced polymer (FRP) use, reviewing recent advancements in the design and processing techniques of composite materials. Part two outlines particular types of fiber-reinforced polymers and covers their use in a wide range of civil engineering and structural applications, including their use in disaster-resistant buildings, strengthening steel

structures and bridge superstructures. With its distinguished editor and international team of contributors, *Developments in fiber-reinforced polymer (FRP) composites for civil engineering* is an essential text for researchers and engineers in the field of civil engineering and industries such as bridge and building construction. Outlines the latest developments in fiber-reinforced polymer composites and their applications in civil engineering Reviews recent advancements in the design and processing techniques of composite materials Covers the use of particular types of fiber-reinforced polymers in a wide range of civil engineering and structural applications

Masonry walls constitute the interface between the building's interior and the outdoor environment. Masonry walls are traditionally composed of fired-clay bricks (solid or perforated) or blocks (concrete or earth-based), but in the past (and even in the present) they were often associated as needing an extra special thermal and acoustical insulation layer. However, over more recent years investigations on thermal and acoustical features has led to the development of new improved bricks and blocks that no longer need these insulation layers. Traditional masonry units (fired-clay bricks, concrete or earth-based blocks) that don't offer improved performance in terms of thermal and acoustical insulation are a symbol of a low-technology past, that are far removed from the demands of sustainable construction. This book provides an up-to-date state-of-the-art review on the eco-efficiency of masonry units, particular emphasis is placed on the design, properties, performance, durability and LCA of these materials. Since masonry units are also an excellent way to reuse bulk industrial waste the book will be important in the context of the Revised Waste Framework Directive 2008/98/EC which states that the minimum reuse and recycling targets for construction and demolition waste (CDW) should be at least 70% by 2020. On the 9th of March 2011 the European Union approved the Regulation (EU) 305/2011, known as the Construction Products Regulation (CPR) and it will be enforced after the 1st of July 2013. The future commercialization of construction materials in Europe makes their environmental assessment mandatory meaning that more information related to the environmental performance of building materials is much needed. Provides an authoritative guide to the eco-efficiency of masonry units Examines the reuse of waste materials Covers a range of materials including, clay, cement, earth and pumice

The urgent need for infrastructure rehabilitation and maintenance has led to a rise in the levels of research into bituminous materials. Breakthroughs in sustainable and environmentally friendly bituminous materials are certain to have a significant impact on national economies and energy sustainability. This book will provide a comprehensive review on recent advances in research and technological developments in bituminous materials. Opening with an introductory chapter on asphalt materials and a section on the perspective of bituminous binder specifications, Part One covers the physiochemical characterisation and analysis of asphalt materials. Part Two reviews the range of distress (damage) mechanisms in asphalt materials, with chapters covering cracking, deformation, fatigue cracking and healing of asphalt mixtures, as well as moisture damage and the multiscale oxidative aging modelling approach for asphalt concrete. The final section of this book investigates alternative asphalt materials. Chapters within this section review such aspects as alternative binders for asphalt pavements such as bio binders and RAP, paving with

asphalt emulsions and aggregate grading optimization. Provides an insight into advances and techniques for bituminous materials
Comprehensively reviews the physicochemical characteristics of bituminous materials Investigate asphalt materials on the nano-scale, including how RAP/RAS materials can be recycled and how asphalt materials can self-heal and rejuvenator selection
Learn to improve the respiratory care of neonates, infants, and children. Neonatal and Pediatric Respiratory Care, 5th Edition gives you a solid foundation in the assessment and treatment of respiratory disorders. Clear, full-color coverage simplifies the principles of respiratory care while emphasizing clinical application. A critical piece in respiratory care's total curriculum solution, this new edition includes all the changes in current clinical practice and in the education environment. Learning objectives at the beginning of each chapter break down key content into measurable behaviors, criteria, and conditions, and self-assessment questions provide an excellent review for the NBRC Neonatal/Pediatric Specialty exam. UPDATED! Content reflects the latest developments in the field meeting the needs of AD programs and BS Respiratory Care programs which are growing in this field. NBRC exam-style assessment questions test your comprehension of the material in each chapter. Neonatal and pediatric disorders case studies provide an opportunity to see how content covered in the text applies to the more difficult areas of care for neonatal and pediatric disorders. Comprehensive test preparation is provided through coverage of all the content in the matrix for the NPS exam. Learning objectives at the beginning of each chapter highlight what you should learn by breaking down key content into measurable behaviors, criteria, and conditions. Academic and authoritative presentation of content covers all of the major topics of respiratory care for neonates, infants, and children, including both theory and application. Dedicated Quality and Safety chapter addresses quality care for the neonatal/pediatric patient. NEW! Revised chapter Invasive Mechanical Ventilation of the Neonate and Pediatric Patient, conforms to the new terminology and taxonomy for modes of ventilation. NEW! Additional case studies provides more application opportunities for you. NEW! Revised content better correlates to the NBRC NPS exam.
This volume gathers the latest advances, innovations, and applications in the field of structural health monitoring (SHM) and more broadly in the fields of smart materials and intelligent systems. The volume covers highly diverse topics, including signal processing, smart sensors, autonomous systems, remote sensing and support, UAV platforms for SHM, Internet of Things, Industry 4.0, and SHM for civil structures and infrastructures. The contributions, which are published after a rigorous international peer-review process, highlight numerous exciting ideas that will spur novel research directions and foster multidisciplinary collaboration among different specialists. The contents of this volume reflect the outcomes of the activities of EWSHM (European Workshop on Structural Health Monitoring) in 2020.

Failure, Distress and Repair of Concrete StructuresElsevier

Excerpt from Automobile Construction and Repair: A Practical Guide to the Design, Construction, and Repair of Automobile Mechanisms
Product of the best technical brains of the country. The engine has changed from the halting, wheezy. Unreliable con traption of fifteen years ago into a perfectly dependable. Well behaved, and sweet-running mechanism which carries its owner at high or low speed. In the heat of summer or the cold of winter. Over all sorts of road with exceedingly rare periods of distress or failure. The same evolution has taken place

with each part of the automobile until practically all the changes in present-day models are simply refinements of the existing mechanisms. No expenditure of money or skill has been spared to make the automobile as near perfect as possible. As a result, it stands today one of our best examples of well-rounded development. A device which has had more to do with our progress in production manufacturing in the last ten years than any other single machine which could be mentioned. Therefore, it behooves those who are interested in this development to study the construction and design factors with great attention. Lessons are to be learned from the evolution of this device. From the failure of that design. And the study of near perfection is always profitable. About the Publisher Forgotten Books publishes hundreds of thousands of rare and classic books. Find more at www.forgottenbooks.com This book is a reproduction of an important historical work. Forgotten Books uses state-of-the-art technology to digitally reconstruct the work, preserving the original format whilst repairing imperfections present in the aged copy. In rare cases, an imperfection in the original, such as a blemish or missing page, may be replicated in our edition. We do, however, repair the vast majority of imperfections successfully; any imperfections that remain are intentionally left to preserve the state of such historical works.

Since 1930 more than 100,000 new chemical compounds have been developed and insufficient information exists on the health assessment of 95 percent of these chemicals in which a relevant percentage are used in construction products. For instance Portland cement concrete, the most used material on the Planet (10.000 million tons/year that in the next 40 years will increase around 100 %) currently used in around 15% of total concrete production contains chemicals used to modify their properties, either in the fresh or hardened state. Biopolymers are materials that are developed from natural resources. They reduce dependence on fossil fuels and reduce carbon dioxide emissions. There is a worldwide demand to replace petroleum-based materials with renewable resources. Currently bio-admixtures represent just a small fraction of the chemical admixtures market (around 20%) but with environmental awareness for constituents in construction materials generally growing (the Construction Products Regulation is being enforced in Europe since 2013), the trend towards bio-admixtures is expected to continue. This book provides an updated state-of-the-art review on biopolymers and their influence and use as admixtures in the development of eco-efficient construction materials. Provides essential knowledge for researchers and producers working on the development of biopolymer-modified construction materials Discusses the various types of biopolymers currently available, their different production techniques, their use as bio-admixtures in concretes and mortars and applications in other areas of civil engineering such as soil stability, wood preservation, adhesives and coatings All contributions are made from leading researchers, who have intensive involvement in the design and use of biopolymers in construction materials

Marine Concrete Structures: Design, Durability and Performance comprehensively examines structures located in, under, or in close proximity to the sea. A major emphasis of the book is on the long-term performance of marine concrete structures that not only represent major infrastructure investment and provision, but are also required to operate with minimal maintenance. Chapters review the design, specification, construction, and operation of marine concrete structures, and examine their performance and durability in the marine environment. A number of case studies of significant marine concrete structures from around the world are included which help to reinforce the principles outlined in earlier chapters and provide useful background to these types of structures. The result is a thorough and up-to-date reference source that engineers, researchers, and postgraduate students in this field will find invaluable. Covers, in detail, the design, specification, construction, and operation of marine concrete structures Examines the properties and performance of concrete in the marine environment Provides case studies on significant marine concrete structures and durability-based design from around the world

