Rehabilitation Of Concrete Structures | ed86809bc1d53906153901463c547522

Guide for Evaluation of Concrete Structures Prior to RehabilitationRepair and Rehabilitation of StructuresFRPRCS-5Case Studies of Rehabilitation, Repair, Retrofitting, and Strengthening of StructuresBridge and Highway Structure Rehabilitation and RepairDecision Based DesignGuide for Evaluation of Concrete Structures Prior to RehabilitationSeismic Rehabilitation of Concrete StructuresConstruction and Rehabilitation of Concrete PavementRepair and Rehabilitation of Reinforced Concrete StructuresACI 562-19 Code Requirements for Assessment, Repair, and Rehabilitation of Existing Concrete Structures (ACI 562-19) and CommentRepair, Rehabilitation, and Maintenance of Concrete Structures, and Innovations in Design and ConstructionRehabilitation and Reconstruction of Buildings IIDurability of Concrete StructuresEvaluation and Rehabilitation of Concrete Structures and Innovations in Design/ MalhotraElectrochemical Rehabilitation Methods for Reinforced Concrete StructuresStrengthening and Retrofitting of Existing StructuresRehabilitation Of Concrete StructuresACI 364. 1R-19 Guide for Assessment of Concrete Structures Before RehabilitationMAINTENANCE, REPAIR & REHABILITATION AND MINOR WORKS OF BUILDINGSREPAIR AND REHABILITATION OF CONCRETE STRUCTURESConcrete Repair, Rehabilitation and Retrofitting IIConcrete Structures Part-II 4th Ed.Retrofitting Design of Building StructuresCorrosion of Steel in ConcreteSeismic Evaluation and Rehabilitation of StructuresRehabilitation, Renovation, and Preservation of Concrete and Masonry StructuresRepair, Rehabilitation, and Maintenance of Concrete Structures, and Innovations in Design and ConstructionFlexural Rehabilitation of Concrete Structures Using NSM FRP CompositesRepair and Rehabilitation of Concrete StructuresConcrete StructuresConcrete Structures Part-II, 2nd EditionSeismic Assessment and Retrofit of Reinforced Concrete BuildingsRehabilitation of Concrete Structures with Fiber-Reinforced PolymerMarine Concrete StructuresStructural Rehabilitation of Old BuildingsEvaluation and Rehabilitation of Concrete Structures and Innovations in DesignBridge Strengthening and RehabilitationInnovation in Repair Techniques of Concrete StructuresEngineering and Design

Guide for Evaluation of Concrete Structures Prior to Rehabilitation

State-of-the-Art Bridge and Highway Rehabilitation and Repair Methods This authoritative volume offers up-to-date guidance on the latest design techniques, repair methods, specialized software, materials, and advanced maintenance procedures for bridges and highway structures. Focusing on both traditional and nontraditional design issues, Bridge and Highway Structure Rehabilitation and Repair clarifies the most recent AASHTO bridge design codes and discusses new analytical and design methodologies, such as the application of load and resistance factor design (LRFD). A wealth of concise explanations, solved examples, and in-depth case studies are included in this comprehensive resource. COVERAGE INCLUDES: Diagnostic design and selective reconstruction Bridge failure studies and safety engineering Analytical approach to fracture and failure Load and resistance factor rating (LRFR) and redesign Application of LRFD and LRFR methods Inspection and structural health monitoring Bridge widening and replacement strategies Conventional repair methods Advanced repair methods Concrete repair methods Extreme events of flood scour and countermeasures design Guidelines for seismic design and retrofit methods

Repair and Rehabilitation of Structures

The 20th Conference on the Rehabilitation and Reconstruction of Buildings (28 - 29 November 2018, Brno, Czech Republic) addresses the issue of building rehabilitation, a field which can be topically classified into the following areas of interest:1. Flaws and failures affecting historical and contemporary buildings; 2. Advanced materials used in buildings reconstruction and 3. Fire safety of buildings. The scientific papers include the areas of remediation of wood structures, building surface treatments (plasters), repair mortars, stone restoration, rehabilitation of masonry, rehabilitation of concrete structures, physicochemical properties of building materials, statics and dynamics of buildings and rehabilitation of timber-frame structures.

FRPRCS-5

Case Studies of Rehabilitation, Repair, Retrofitting, and Strengthening of Structures

Repair and Rehabilitation of Structures provides practitioners with a host of new and traditional strategies for rooting out structural problems and deploying an efficient repair or rehabilitation solution. The success of repair activity depends on the identification of the root cause of the deterioration of structures. A straight forward approach to the repair and rehabilitation of structures, the book discusses the different aspects of repair, causes of repair, strength and durability of concrete, special concrete, techniques for repair and protection method, retrofitting of structures, structural health monitoring (SHM) demolition techniques and seismic retrofitting of structures. In addition, the book includes real world case studies to better illustrate techniques adopted for the rehabilitation throughout the world. Presents a framework for evaluating maintenance and repair strategies Provides an Introduction to SHM, Smart Materials and SHM versus NDT Includes case studies to illustrate practical techniques adopted for the rehabilitation of the existing structure Outlines the performance of construction materials and components in actual structure, permeability and thermal properties of concrete

Bridge and Highway Structure Rehabilitation and Repair

Decision Based Design

Guide for Evaluation of Concrete Structures Prior to Rehabilitation

Seismic Rehabilitation of Concrete Structures

Construction and Rehabilitation of Concrete Pavement

This present book describes the different construction systems and structural materials and elements within the main buildings typologies, and it analyses the particularities of each of them, including, at the end, general aspects concerning laboratory and in-situ testing, numerical modeling, vulnerability assessment and construction maintenance.

Repair and Rehabilitation of Reinforced Concrete Structures

This collection contains five papers discussing the repair of deteriorated or damaged concrete structures presented at a session at the ASCE National Convention, held in Dallas, Texas, October 24-28, 1993.

ACI 562-19 Code Requirements for Assessment, Repair, and Rehabilitation of Existing Concrete Structures (ACI 562-19) and Comment

Repair, Rehabilitation, and Maintenance of Concrete Structures, and Innovations in Design and Construction

Corrosion of Steel in Concrete provides information on corrosion of steel in atmospherically exposed concrete structures and serves as a guide for those designing, constructing and maintaining buildings, bridges and all reinforced concrete structures. This new edition incorporates the new European standards as well as USA and other international standards. It also covers developments in galvanic and impressed current cathodic protection, new electrochemical techniques such as electro-osmosis, and stainless steel clad reinforcing bars. The corrosion of reinforcing steel in concrete is a major problem facing civil engineers and surveyors throughout the world today. There will always be a need to build structures in corrosive environments and it is therefore essential to address the problems that result. This is a book to educates about and forms a guide to the problems of corrosion, its causes and how to find solutions.

Rehabilitation and Reconstruction of Buildings II

Durability of Concrete Structures

Evaluation and Rehabilitation of Concrete Structures and Innovations in Design/ Malhotra

Electrochemical Rehabilitation Methods for Reinforced Concrete Structures

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.

Strengthening and Retrofitting of Existing Structures

Retrofitting of building structures, including maintenance, rehabilitation, and strengthening, is not only an important issue in urban construction and management, but also a frequent problem to structural engineers in property management disciplines. Based on the contributors' hands-on experience, Retrofitting Design of Building Structures covers structural retrofitting practices, the basic principles of structural analysis and design, and various innovatively-used structural codes for the design, assessment, and retrofitting of building structures using newly-developed technologies worldwide. Beginning with the procedure of structural retrofitting, this book gradually introduces the significance of structural retrofitting; the inspection methods for structural materials, structural deformation, and damages; retrofitting design methods and construction requirements of various structural systems; and practical examples of structural retrofitting design and construction. In the introduction of various examples, it emphasizes not only

conceptual design, but also constructional procedure design, so that a structural retrofitting design work should be completed by both structural analysis and detailed constructional measures. The book provides a complete resource for experienced professionals as well as teachers and students.

Rehabilitation Of Concrete Structures

Seismic retrofitting is the modification of existing structures to make them more resistant to seismic activity, ground motion, or soil failure due to earthquakes. The planning of changes to existing buildings differs from new planning through an important condition; the existing construction must be taken as the basis of all planning and building actions. The need for seismic retrofitting of an existing building can arise due to several reasons like: building not designed to code, subsequent updating of code and design practice, subsequent upgrading of seismic zone, deterioration of strength and aging, modification of existing structure, change in use of the building, etc. Seismic retrofit is primarily applied to achieve public safety, with various levels of structure and material survivability determined by economic considerations. In recent years, an increased urgency has been felt to strengthen the deficient buildings, as part of active disaster mitigation, and to work out the modifications that may be made to an existing structure to improve the structural performance during an earthquake. Seismic retrofitting schemes can be either global or local, based on how many members of the structures they are used for. Global Retrofit methods include conventional methods (increase seismic resistance of existing structures) or non-conventional methods (reduction of seismic demand). Strengthening and Retrofitting of Existing Structures is a compendium of cutting-edge trends of the research and existing practices in strengthening and retrofitting of structural elements, as well as the findings of a research endeavor initiated by the authors to investigate and develop a robust structural retrofitting scheme by utilizing elastomeric polymers to enhance the resistance of reinforced concrete (RC) structures. It addresses in detail specific techniques for the strengthening of traditional constructions, reinforced concrete buildings, bridges and their foundations. It also presents insight into the key issues relevant to seismic retrofit of concrete frame buildings. Many guidelines are reviewed regarding seismic rehabilitation of school, office, hospital and apartment buildings.

ACI 364. 1R-19 Guide for Assessment of Concrete Structures Before Rehabilitation

This book is prepared according to the 2019 ACI Code for buildings and 2007 AASHTO LRFD Specifications for bridges. The units used throughout the presentation are the SI units according to the official system of units in Pakistan. As in Part-I of the same series of books, it is tried that the three main phases of structural design, namely load determination, design calculations and detailing are together introduced to the beginner. In this set of two books, besides the usual reinforced concrete design, retaining walls, yield line and strip method of slab design, slabs-on-grade, moment-curvature relationships, water retaining structures, prestressed concrete, dome design, special types of stairs, machine foundations, pipe design for D-load, bridge super-structure design, bridge sub-structure design, ordinary RC wall subjected to in-plane and out-of-plane bending, special RC wall, coupling beam, basics of formwork design, plain concrete properties and repair / rehabilitation of concrete structures are also presented. This book is useful with the 1st part of the same book.

MAINTENANCE, REPAIR & REHABILITATION AND MINOR WORKS OF BUILDINGS

PART 1: DURABILITY AND DETERIORATION: Physical Cause* Corrosion* PART 2: DAMAGE ASSESSMENT: Destructive Testing Systems* Non-Destructive Testing Systems* Semi-Detructive Testiing Systems* PART 3: REPAIR MATERIALS: Selection and Evaluation of Repair Materials* Fuction of Repair Materials* Special Repair Materials* PART 4: REPAIR ND REHABILATION: Repair of Cracks* Rehabilitation Techniques* Strengthening Techniques* PART 5: MAINTENANCE AND DEMOLITION: Maintence Classification And Process* Maintenance Procedurte* Safety In Maintenance And Demolition* Index.

REPAIR AND REHABILITATION OF CONCRETE STRUCTURES

In most parts of the developed world, the building stock and the civil infrastructure are ageing and in constant need of maintenance, repair and upgrading. Moreover, in the light of our current knowledge and of modern codes, the majority of buildings stock and other types of structures in many parts of the world are substandard and deficient. This is especially so in earthquake-prone regions, as, even there, seismic design of structures is relatively recent. In those regions the major part of the seismic threat to human life and property comes from old buildings. Due to the infrastructure's increasing decay, frequently combined with the need for structural upgrading to meet more stringent design requirements (especially against seismic loads), structural retrofitting is becoming more and more important and receives today considerable emphasis throughout the world. In response to this need, a major part of the fib Model Code 2005, currently under development, is being devoted to structural conservation and maintenance. More importantly, in recognition of the importance of the seismic threat arising from existing substandard buildings, the first standards for structural upgrading to be promoted by the international engineering community and by regulatory authorities alike are for seismic rehabilitation of buildings. This is the case, for example, of Part 3: Strengthening and Repair of Buildings of Eurocode 8 (i. e. of the draft European Standard for earthquake-resistant design), and which is the only one among the current (2003) set of 58 Eurocodes attempting to address the problem of structural upgrading. It is also the case of the recent (2001) ASCE draft standard on Seismic evaluation of existing buildings and of the 1996 Law for promotion of seismic strengthening of existing reinforced concrete structures in Japan. As noted in Chapter 1 of this Bulletin, fib - as CEB and FIP did before - has placed considerable emphasis on assessment and rehabilitation of existing structures. The present Bulletin is a culmination of this effort in the special but very important field of seismic assessment and rehabilitation. It has been elaborated over a period of 4 years by Task Group 7.1 Assessment and retrofit of existing structures of fib Commission 7 Seismic design, a truly international team of experts, representing the expertise and experience of all the important seismic regions of the world. In the course of its work the team had six plenary two-day meetings: in January 1999 in Pavia, Italy; in August 1999 in Raleigh, North Carolina; in February 2000 in Queenstown, New

Zealand; in July 2000 in Patras, Greece; in March 2001 in Lausanne, Switzerland; and in August 2001 in Seattle, Washington. In October 2002 the final draft of the Bulletin was presented to public during the 1st fib Congress in Osaka. It was also there that it was approved by fib Commission 7 Seismic Design. The contents is structured into main chapters as follows: 1 Introduction - 2 Performance objectives and system considerations - 3 Review of seismic assessment procedures - 4 Strength and deformation capacity of non-seismically detailed components - 5 Seismic retrofitting techniques - 6 Probabilistic concepts and methods - 7 Case studies

Concrete Repair, Rehabilitation and Retrofitting II

This is a state of the art report on two of the main electrochemical methods for the rehabilitation of reinforced concrete structures - electrochemical chloride extraction and electrochemical realkalisation. The principles, laboratory and field experience, effectiveness and long-term behaviour of the procedures are considered.

Concrete Structures Part-II 4th Ed.

In the past, facilities considered to be at the end of their useful life were demolished and replaced with new ones that better met the functional requirements of modern society, including new safety standards. Humankind has recently recognised the threats to the environment and to our limited natural resources due to our relentless determination to destroy the old and build anew. With the awareness of these constraints and the emphasis on sustainability, in future the majority of old structures will be retrofitted to extend their service life as long as feasible. In keeping with this new approach, the EU's Construction Products Regulation 305/2011, which is the basis of the Eurocodes, included the sustainable use of resources as an "Essential Requirement" for construction. So, the forthcoming second generation of EN-Eurocodes will cover not only the design of new structures, but the rehabilitation of existing ones as well. Most of the existing building stock and civil infrastructures are seismically deficient. When the time comes for a decision to prolong their service life with the help of structural and architectural upgrading, seismic retrofitting may be needed. Further, it is often decided to enhance the earthquake resistance of facilities that still meet their functional requirements and fulfil their purpose, if they are not earthquake-safe. In order to decide how badly a structure needs seismic upgrading or to prioritise it in a population of structures, a seismic evaluation is needed, which also serves as a guide for the extent and type of strengthening. Seismic codes do not sufficiently cover the delicate phase of seismic evaluation nor the many potential technical options for seismic upgrading; therefore research is on-going and the state-of-the-art is constantly evolving. All the more so as seismic evaluation and rehabilitation demand considerable expertise, to make best use of the available safety margins in the existing structure, to adapt the engineering capabilities and techniques at hand to the particularities of a project, to minimise disruption of use, etc. Further, as old structures are very diverse in terms of their materials and layout, seismic retrofitting does not lend itself to straightforward codified procedures or cook-book approaches. As such, seismic evaluation and rehabilitation need the best that the current state-of-the-art can offer on all aspects of earthquake engineering. This volume serves this need, as it gathers the most recent research of top seismic experts from around the world on seismic evaluation, retrofitting and closely related subjects.

Retrofitting Design of Building Structures

Many existing concrete structures were designed in accordance with outdated standards or specifications that do not satisfy current design requirements and are being rated as structurally deficient. Furthermore, upgrades on those structures often demand them to carry larger loads, resulting in a need to repair and strengthen. The retrofitting technique using near-surface-mounted (NSM) fiber-reinforced polymer (FRP) composite materials has emerged and proved to be a reliable alternative to the externally bonded (EB) FRP method. Although NSM FRP technique has been applied to real structures in the field, more detailed design guides are still in need. More experimental and theoretical data are needed to establish those guides, which cover comprehensive aspects of the technique. In this study, the NSM FRP method was, therefore, investigated at three levels: material, sub-component (bond characteristics), and structural level (flexural strengthening). Through the material level study, main material properties of FRP rods were obtained, which were used for fundamental information for the sub-component and structural level study. Crucial factors for the NSM FRP technique were assessed at the sub-component and structural levels and the correlation between the two levels was investigated. First, tensile tests were carried out in the laboratory to obtain the main material properties of FRP reinforcements used in the study, such as the elastic modulus, tensile strength, and ultimate strain. To avoid any slippage while loading, an effective surface treatment was developed and applied to the surface of FRP rods. The material properties are listed and compared with those by the manufacturers. FRP rods were pulled out from a total of 109 concrete blocks (350 x 300 x 150 mm) to evaluate bond characteristics between the FRP rods and concrete. A direct pull-out configuration was utilized. Variables for the bond study include: surface conditions (smooth, sand coated, ribbed, spirally wound and sand coated, grooved, spirally wound and sand coated and indented, and roughened), cross-sectional shapes (round, square, and strip), and material types (carbon and glass). In addition, the effects of groove sizes (three different dimensions for each type of FRP reinforcement) and adhesive types (one acrylic and six epoxies) were evaluated. The test results showed that surface treatment affected bond behavior and the spiral winding and sand coating with indentation seemed to be most efficient. The strip shape was more effective than round and square shapes. Higher bond strength was obtained in using carbon FRP (CFRP) than glass FRP (GFRP). In general, increasing groove sizes was effective in improving bond capacity. The bond strength of the specimen was generally dependent on the bond strength of the adhesive. The effect of flexural strengthening using eight different NSM FRP reinforcements on pre-damaged reinforced concrete (RC) bridge slab overhangs (1.5 m long in overhang and 0.9 m wide) was assessed. In total, thirteen full-scale overhangs were examined with four test parameters related to the FRP reinforcement: a) material types (carbon and glass); b) cross-sectional shapes (round, strip, and square); c) surface configurations (smooth, spirally wound and sand coated, sand coated, ribbed, and roughened); and d) degree of prestressing. The test results showed that the NSM FRP technique was effective in increasing both yield and ultimate load-carrying capacity of the pre-damaged RC bridge slab overhangs. With a similar amount of axial stiffness among the strengthened specimens, GFRP rods were as efficient as CFRP rods. All surface treatments were more beneficial than the smooth condition. The

square-shaped FRP reinforcement displayed better performance than the round shape. The prestressing unit developed in this study was simple to apply and could be further explored for the field applications. Theoretical results from moment-curvature analysis were in good agreement with experimental ones. Furthermore, crucial design parameters such as bond-dependent coefficient and optimum groove sizes were investigated. To avoid debonding failure of structures strengthened with NSM FRP reinforcement, the bond-dependent coefficient is recommended rather than a complicated model. Nonlinear regression analysis was performed using experimental results obtained from this study and literature. Through the analysis, simple models were developed. From the standpoint of efficiency and cost, optimum groove sizes are essential for a designer. Based on the database obtained from the current study and literature, the optimum groove dimensions for types of FRP rods were proposed.

Corrosion of Steel in Concrete

The field of Concrete Repair and Rehabilitation is gaining importance in view of its positive impacts in terms of socio-economic benefits and environmental sustainability. Due to growing importance of this field, many engineering colleges have included the subject of concrete repair and rehabilitation in the senior undergraduate and postgraduate course curriculums of civil engineering. This book is an earnest attempt to help students of civil engineering in enhancing their understanding and awareness about critical elements of repair and rehabilitation of concrete structure. The content is organised in such a way that it fulfils the academic needs of the students. This text attempts to dovetail all important aspects such as causes of distress, assessment and evaluation of deterioration, techniques for repair and rehabilitation along with selection of repair and rehabilitation materials and other important aspects related to preventive maintenance and rehabilitation/structural safety measures. The primary objective of this textbook is to guide students to: • Understand the underlying causes and types of deterioration in concrete structure • Learn about the field and laboratory testing methods available to evaluate the level of deterioration. • Get well acquainted with options of repair materials and techniques available to address different types of distress in concrete structure. • Grasp the knowledge of available techniques and their application for strengthening existing structural systems.

Seismic Evaluation and Rehabilitation of Structures

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)

Rehabilitation, Renovation, and Preservation of Concrete and Masonry Structures

Fibre reinforced plastics are increasingly being used as replacements for steel reinforcement in concrete structures. The reinforcement can be untensioned, or it can be in the form of prestressing tendons. It is also suitable for gluing onto the outside of a structure to improve flexural or shear performance. This book provides up-to-date research results to give engineers confidence in their design methods.

Repair, Rehabilitation, and Maintenance of Concrete Structures, and Innovations in Design and Construction

Proceedings of an international seminar, workshop, and exhibition, held in Maracaibo, Venezuela, April 28-May 1, 1997. Sponsored by National Science Foundation; Science and Technology Program (CYTED). Organized by NACE International Latin American Region Venezuelan Section; Venezuelan Corrosion Association (ASVENCOR); the Center for Hemispherical Cooperation (CoHemis), University of Puerto Rico; Center for Corrosion Studies, Universidad del Zulia, Maracaibo, Venezuela. This collection contains 17 papers that present international knowledge about reinforced concrete structures. Papers also describe future directions and propose joint research projects for repair and rehabilitation of reinforced concrete structures. Topics include: corrosion, service life, new materials, concrete block deterioration, vibration measurements, stainless steel rebar behaviors, and diagnosis and repair procedures resulting from overloads on a concrete parking structure. Summaries of workshop discussions are presented in Spanish and English.

Flexural Rehabilitation of Concrete Structures Using NSM FRP Composites

Repair and Rehabilitation of Concrete Structures

In a presentation that formalizes what makes up decision based design, Decision Based Design defines the major concepts that go into product realization. It presents all major concepts in design decision making in an integrated way and covers the fundamentals

of decision analysis in engineering design. It also trains engineers to understand the impacts of design decision. The author teaches concepts in demand modeling and customer preference modeling and provides examples. This book teaches most fundamental concepts encountered in engineering design like: concept generation, multiattribute decision analysis, reliability engineering, design optimization, simulation, and demand modeling. The book provides the tools engineering practitioners and researchers need to first understand that engineering design is best viewed as a sequence of decisions made by the stakeholders involved and then apply the decision based design concepts in practice. It teaches fundamental concepts encountered in engineering design, such as concept generation, multiattribute decision analysis, reliability engineering, design optimization, simulation, and demand modeling. This book helps students and practitioners understand that there is a rigorous way to analyze engineering decisions taking into consideration all the potential technical and business impacts of their decisions. It can be used in its entirety to teach a course in decision based design, while selected chapters can also be used to cover courses in subdisciplines that make up decision based design.

Concrete Structures

Concrete Structures Part-II, 2nd Edition

Seismic Assessment and Retrofit of Reinforced Concrete Buildings

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

Rehabilitation of Concrete Structures with Fiber-Reinforced Polymer

Marine Concrete Structures

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).

Structural Rehabilitation of Old Buildings

The success of a repair or rehabilitation project depends on the specific plans designed for it. Concrete Structures: Protection, Repair and Rehabilitation 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 provided for engineers focused on maintaining concrete and preparing concrete investigation reports for repair and rehabilitation projects. Considerations for certain specialized types of rehabilitation projects are also given. In addition, the author translates cryptic codes, theories, specifications and details into easy to understand language. Tip boxes are used to highlight key elements of the text as well as code considerations based on the International Code Council or International Building Codes. The book contains various worked out

examples and equations. Case Studies will be included along with diagrams and schematics to provide visuals to the book. Deals primarily with evaluation and repair of concrete structures Provides the reader with a Step by Step method for evaluation and repair of Structures Covers all types of Concrete structures ranging from bridges to sidewalks Handy tables outlining the properties of certain types of concrete and their uses

Evaluation and Rehabilitation of Concrete Structures and Innovations in Design

Provides a comprehensive approach to the overall engineering discipline of bridge strengthening, rehabilitation and replacement. Includes extensive detail and examples of how to evaluate the condition of bridges. Provides detailed information on analyzing the cost-effectiveness and service life of proposed bridge repairs, and helps with the repair-vs.-replace decision. Offers comprehensive coverage of available methods for strengthening existing bridges. Civil engineers, transportation engineers, structural engineers and construction engineers involved in transportation structures.

Bridge Strengthening and Rehabilitation

Innovation in Repair Techniques of Concrete Structures

The term Maintenance of a building refers to the work done for keeping an existing building in a condition where it can perform its intended functions. Usually, the buildings last only for 40 to 50 years in a good shape just because of regular inspection and maintenance that enable timely identification of deteriorated elements. Overlooked dilapidation, inadequate maintenance and lack of repair works may lead to limited life span of a building. This comprehensive book, striving to focus on the maintenance, repair & rehabilitation and minor works of a building, presents useful guidelines that acquaint the readers with the traditional as well as modern techniques for upkeeping and repairing of buildings already constructed. Dexterously organised into five parts, this book in Part I deals with the maintenance of buildings. Description of the construction chemicals, concrete repair chemicals, special materials used for repair, and repair of various parts of a building is given in Part II. Strengthening of reinforced concrete members by shoring, underpinning, plate bonding, RC jacketing and FRP methods are explored in Part III, which also highlights rebuilding of RC slabs and protection of earth slopes. Part IV of the book exposes the reader to the minor works done in a building such as construction of compound walls, gates, waters sumps, house garage, relaying of floors, joining two adjacent rooms and so on. Part V is based on some allied topics involving control on termites and fungus in buildings as well as introduction of Vaastu Shastra and its main recommendations for a single house in a plot. Using an engaging style, this book will prove to be a must-read for the undergraduate and postgraduate students of civil engineering as well as for the polytechnic and ITI diploma students. Besides, the book will also be of immense benefit to the technical professionals across the country. KEY FEATURES • The text displays several figures to make the concepts clear. • Chapter-end references make the text suitable for further study. • Appendices at the end of the text provide extra information on non-destructive field tests for survey of the condition of concrete buildings and rough estimation of the construction and maintenance costs of buildings.

Engineering and Design