The Fib Model Code For Concrete Structures 2010

Despite using them every day, most software engineers know little about how programming languages are designed and implemented. For many, their only experience with that corner of computer science was a terrifying "compilers" class that they suffered through in undergrad and tried to blot from their memory as soon as they had scribbled their last NFA to DFA conversion on the final exam. That fearsome reputation belies a field that is rich with useful techniques and not so difficult as some of its practitioners might have you believe. A better understanding of how programming languages are built will make you a stronger software engineer and teach you concepts and data structures you'll use the rest of your coding days. You might even have fun. This book teaches you everything you need to know to implement a full-featured, efficient scripting language. You'll learn both high-level concepts around parsing and semantics and gritty details like bytecode representation and garbage collection. Your brain will light up with new ideas, and your hands will get dirty and calloused. Starting from main(), you will build a language that features rich syntax, dynamic typing, garbage collection, lexical scope, first-class functions, closures, classes, and inheritance. All packed into a few thousand lines of clean, fast code that you thoroughly understand because you wrote each one yourself.

The Book of R is a comprehensive, beginner-friendly guide to R, the world’s most popular programming language for statistical analysis. Even if you have no programming experience and little more than a grounding in the basics of mathematics, you’ll find everything you need to begin using R effectively for statistical analysis. You’ll start with the basics, like how to handle data and write simple programs, before moving on to more advanced topics, like producing statistical summaries of your data and performing statistical tests and modeling. You’ll even learn how to create impressive data visualizations with R’s basic graphics tools and contributed packages, like ggplot2 and ggvis, as well as interactive 3D visualizations using the rgl package. Dozens of hands-on exercises (with downloadable solutions) take you from theory to practice, as you learn: -The fundamentals of programming in R, including how to write data frames, create functions, and use variables, statements, and loops -Statistical concepts like exploratory data analysis, probabilities, hypothesis tests, and regression modeling, and how to execute them in R -How to access R’s thousands of functions, libraries, and data sets -How to draw valid and useful conclusions from your data -How to create publication-quality graphics of your results Combining detailed explanations with real-world examples and exercises, this book will provide you with a solid understanding of both statistics and the depth of R’s functionality. Make The Book of R your doorway into the growing world of data analysis.

This book examines the application of strut-and-tie models (STM) for the design of structural concrete. It presents state-of-the-art information, from fundamental theories to practical engineering applications, and also provides innovative solutions for many design problems that are not otherwise achievable using the traditional methods.

Serviceability failures of concrete structures involving excessive cracking or deflection are relatively common, even in structures that comply with code requirements. This is often as a result of a failure to adequately account for the time-dependent deformations of concrete in the design of the structure. The serviceability provisions embodied in codes of practice are relatively crude and, in some situations, unreliable and do not adequately model the in-service behaviour of structures. In particular, they fail to adequately account for the effects of creep and shrinkage of the concrete. Design for serviceability is complicated by the non-linear and inelastic behaviour of concrete at service loads. Providing detailed information, this book helps engineers to rationally predict the time-varying deformation of concrete structures under typical in-service conditions. It gives analytical methods to help anticipate time-dependent cracking, the gradual change in tension stiffening with time, creep induced deformations and the load independent strains caused by shrinkage and temperature changes. The calculation procedures are illustrated with many worked examples. A vital guide for practising engineers and advanced students of structural engineering on the design of concrete structures for serviceability and provides a penetrating insight into the time-dependent behaviour of reinforced and prestressed concrete structures.

Bond and anchorage of embedded reinforcement: Background to the fib Model Code for Concrete Structures 2010

Polymer-duct systems for internal bonded post-tensioning

Externally Bonded FRP Reinforcement for RC Structures

Life-Cycle Civil Engineering: Innovation, Theory and Practice

The Fib

Time-Dependent Behaviour of Concrete Structures

As part of the preparation for the fib Model Code for Concrete Structures 2010, task group 4.5 Bond Models undertook a major review of rules for bond and anchorage of reinforcement in the CEB-FIP Model Code 1990. This bulletin presents the outcome of that review, describes the rationale for the revisions and presents the evidence on which the revisions are based. The principle changes in MC2010 include raising the limit on concrete strength that may be used when determining bond resistance to 110MPa, introduction of a coefficient η4 to cater for different reinforcement Classes, and coverage of new construction materials including epoxy coated and headed bars. The format of design rules has been changed to permit more rational treatment of confinement from concrete cover and transverse reinforcement, the contribution of end hooks

and bends for tension bars, and end bearing to compression laps. New guidance is provided covering a range of construction techniques and service environments and the influence of long term degradation. Analyses of various aspects of detailing on performance of laps and anchorages have resulted in discontinuation of the ‘proportion lapped’ factor α6, alterations to requirements of transverse reinforcement at laps, and have resolved inconsistencies in provisions for bundled bars between major national codes. Apparent inconsistencies in existing rules for lapped joints and anchorages and between the local bond/slip model and design rules are also resolved, thus allowing integration of application rules and modelling. Finally, the basis for an attempt to introduce simple detailing rules for laps and anchorages is described.

The International Federation for Structural Concrete (fib) is a pre-normative organization. 'Pre-normative' implies pioneering work in codification. This work has now been realized with the fib Model Code 2010. The objectives of the fib Model Code 2010 are to serve as a basis for future codes for concrete structures, and present new developments with regard to concrete structures, structural materials and new ideas in order to achieve optimum behaviour. The fib Model Code 2010 is now the most comprehensive code on concrete structures, including their complete life cycle: con.

Detailing is an essential part of the design process. This thorough reference guide for the design of reinforced concrete structures is largely based on Eurocode 2 (EC2), plus other European design standards such as Eurocode 8 (EC8), where appropriate.With its large format, double-page spread layout, this book systematically details 213 structural

Atrial fibrillation is emerging as the new epidemic in cardiovascular disease. This book helps patients research their best treatment options, steps through how to find the right doctor for their type of A-Fib and treatment goals, gives patients hope and empowers them to develop a plan for finding the A-Fib cure or best outcome.

Proceedings of the 7th International Symposium on Life-Cycle Civil Engineering (IALCCE 2020), October 27-30, 2020, Shanghai, China

Background of the Constitutive Relations and Material Models in the Fib Model Code for Concrete Structures 2010

Model Code 2010 - Final draft

Model Code 2010 - First complete draft - Volume 2

Guide to Good Practice

Multi-Storey Precast Concrete Framed Structures

In December 1996, the then CEB established a Task Group with the main objective to elaborate design guidelines for the use of FRP reinforcement in accordance with the design format of the CEB-FIP Model Code and Eurocode2. With the merger of CEB and FIP into fib in 1998, this Task Group became fib TG 9.3 FRP Reinforcement for concrete structures in Commission 9 Reinforcing and Prestressing Materials and Systems. The Task Group consists of about 60 members, representing most Europea universities, research institutes and industrial companies working in the field of advanced composite reinforcement for concrete structures, as well as corresponding members from Canada, Japan and USA. Meetings are held twice a year and on the researcl level its work is supported by the EU TMR (European Union Training and Mobility of Researchers) Network "ConFibreCrete”. The work of fib TG 9.3 is performed by five working parties (WP): Material Testing and Characterization (MT&C) Reinforced Concrete (RC) Prestressed Concrete (PC) Externally Bonded Reinforcement (EBR) Marketing and Applications (M&A) This technical report constitutes the work conducted as of to date by the EBR party. This bulletin gives detailed design guidelines on the use of FRP EBR, the practical execution and the quality control, based on the current expertise and state-of-the-art knowledge of the task group members. It is regarded as a progress report since it is not the aim of this report to cover all aspects RC strengthening with composites. Instead, it focuses on those aspects that form the majority of the design problems. several of the topics presented are subject of ongoing research and development, and the details of some modelling approaches may be subject to future revisions. as knowledge in this field is advancing rapidly, the work of the EBR WP will continue. Inspite of this limit in scope, considerable effort has been made to present a bulletin that is today’s state-of-art in the area of strengthening of concrete structures by means of externally bonded FRP reinforcement.

Tunnels and Underground Cities: Engineering and Innovation meet Archaeology, Architecture and Art contains the contributions presented at the World Tunnel Congress 2019 (Naples, Italy, 3-9 May 2019). The use of underground space is continuing to grow, due to global urbanization, public demand for efficient transportation, and energy saving, production and distribution. The growing need for space at ground level, along with its continuous value increase and the challenges of energy saving and achieving sustainable development objectives, demand greater and better use of the underground space to ensure th it supports sustainable, resilient and more liveable cities. This vision was the source of inspiration for the design of the logos of both the International (ITA) and Italian (SIG) Tunnelling Association. By placing key infrastructures underground – the black circle in the logos – it will be possible to preserve and enhance the quality of the space at ground level – the green line. In order t consider and value underground space usage together with human and social needs, engineers, architects, and artists will have t learn to collaborate and develop an interdisciplinary design approach that addresses functionality, safety, aesthetics and quality o life, and adaptability to future and varied functions. The 700 contributions cover a wide range of topics, from more traditional subjects connected to technical challenges of design and construction of underground works, with emphasis on innovation in tunneling engineering, to less conventional and archetypically Italian themes such as archaeology, architecture, and art. The book has the following main themes: Archaeology, Architecture and Art in underground construction; Environment sustainability in underground construction; Geological and geotechnical knowledge and requirements for project implementation; Ground improvement in underground constructions; Innovation in underground engineering, materials and equipment; Long and deep tunnels; Public communication and awareness; Risk management, contracts and financial aspects; Safety in underground construction; Strategic use of underground space for resilient cities; Urban tunnels. Tunnels and Underground Cities: Engineering and Innovation meet Archaeology, Architecture and Art is a valuable reference text for tunneling specialists, owners, engineers, architects and others involved in underground planning, design and building around the world, and for academics who are interested in underground constructions and geotechnics.

“Interesting...Bowlin's calmly rational approach to the subject of conspiracy theories shows the importance of logic and evidence.”—Booklist "A page-turning book to give to someone who believes in pizza pedophilia or that the Illuminati rule the world."—Kirkus Reviews The co-hosts of the hit podcast Stuff They Don’t Want You to Know, Ben Bowlin, Matthew Frederick, &

Noel Brown, discern conspiracy fact from fiction in this sharp, humorous, compulsively readable, and gorgeously illustrated book. In times of chaos and uncertainty, when trust is low and economic disparity is high, when political institutions are crumbling and cultural animosities are building, conspiracy theories find fertile ground. Many are wild, most are untrue, a few are hard to ignore, but all of them share one vital trait: there's a seed of truth at their center. That seed carries the sordid, conspiracy-riddled history of our institutions and corporations woven into its DNA. Ben Bowlin, Matt Frederick, and Noel Brown host the popular iHeart Media podcast, Stuff They Don't Want You To Know. They are experts at exploring, explaining, and interrogating today's emergent conspiracies—from chem trails and biological testing to the secrets of lobbying and the indisputable evidence of UFOs. Written in a smart, witty, and conversational style, elevated with amazing illustrations, Stuff They Don't Want You to Know is a vital book in understanding the nature of conspiracy and using truth as a powerful weapon against ignorance, misinformation, and lies.

Life-Cycle Civil Engineering: Innovation, Theory and Practice contains the lectures and papers presented at IALCCE2020, the Seventh International Symposium on Life-Cycle Civil Engineering, held in Shanghai, China, October 27-30, 2020. It consists of a book of extended abstracts and a USB card containing the full papers of 230 contributions, including the Fazlur R. Khan lecture, eight keynote lectures, and 221 technical papers from all over the world. All major aspects of life-cycle engineering are addressed with special emphasis on life-cycle design, assessment, maintenance and management of structures and infrastructure systems under various deterioration mechanisms due to various environmental hazards. It is expected that the proceedings of IALCCE2020 will serve as a valuable reference to anyone interested in life-cycle of civil infrastructure systems, including students, researchers, engineers and practitioners from all areas of engineering and industry.

Concrete Segmental Bridges

Arthur's Classroom Fib [With Stickers]

Technical report

CEB-FIP Model Code 1990

Externally applied FRP reinforcement for concrete structures

Precast segmental bridges

I was sick of Gordon Barraclough. Sick of his bullying. And I was sick of him being a good footballer. 'Listen, Barraclough. My uncle is Bobby Charlton.' 'You're a liar.' I was. 'I'm not. Cross my heart and hope to die.' I spat on my hand. If I'd dropped down dead on the spot I wouldn't have been surprised. 'Funny and moving.... a rare gift.' Guardian

This book contains the proceedings of the fib Symposium "High Tech Concrete: Where Technology and Engineering Meet", that was held in Maastricht, The Netherlands, in June 2017. This annual symposium was organised by the Dutch Concrete Association and the Belgian Concrete Association. Topics addressed include: materials technology, modelling, testing and design, special loadings, safety, reliability and codes, existing concrete structures, durability and life time, sustainability, innovative building concepts, challenging projects and historic concrete, amongst others. The fib (International Federation for Structural Concrete) is a not-for-profit association committed to advancing the technical, economic, aesthetic and environmental performance of concrete structures worldwide.

This design code for concrete structures is the result of a complete revision to the former Model Code 1978, which was produced jointly by CEB and FIP. The 1978 Model Code has had a considerable impact on the national design codes in many countries. In particular, it has been used extensively for the harmonisation of national design codes and as basic reference for Eurocode 2. The 1990 Model Code provides comprehensive guidance to the scientific and technical developments that have occurred over the past decade in the safety, analysis and design of concrete structures. It has already influenced the codification work that is being carried out both nationally and internationally and will continue so to do.

fib Bulletin 34 addresses Service Life Design (SLD) for plain concrete, reinforced concrete and pre-stressed concrete structures, with a special focus on design provisions for managing the adverse effects of degradation. Its objective is to identify agreed durability related models and to prepare the framework for standardization of performance based design approaches. Four different options for SLD are given: - a full probabilistic approach, - a semi probabilistic approach (partial factor design), - deemed to satisfy rules, - avoidance of deterioration. The service life design approaches described in this document may be applied for the design of new structures, for updating the service life design if the structure exists and real material properties and/or the interaction of environment and structure can be measured (real concrete covers, carbonation depths), and for calculating residual service life. The bulletin is divided into five chapters: 1. General 2. Basis of design 3. Verification of Service Life Design 4. Execution and its quality management 5. Maintenance and condition control It also includes four informative annexes, which give background information and examples of procedures and deterioration models for the application in SLD. The format of Bulletin 34 follows the CEB-FIP tradition for Model Codes: the main provisions are given on the right-hand side of the page, and on the left-hand side, the comments. Note: An Italian translation of Bulletin 34 is also available; contact us for further details.

Proceedings of the WTC 2019 ITA-AITES World Tunnel Congress (WTC 2019), May 3-9, 2019, Naples, Italy

Partial factor methods for existing concrete structures

Technical Report on the Design and Use of Externally Bonded Fibre Reinforced Polymer (FRP) Reinforcement for Reinforced Concrete (RC) Structures

Fibre Reinforced Concrete: Improvements and Innovations II

Proceedings of the 2017 fib Symposium, held in Maastricht, The Netherlands, June 12-14, 2017

Modelling of Corroding Concrete Structures

When best friends Doug-Dennis and Ben-Bobby go to the circus, something terrible happens. Doug- Dennis eats all of his friend's popcorn, and then tells a fib (It wasn't me!), which grows and grows (Maybe monsters ate it!), carrying

Doug-Dennis away. As the lie gets bigger, Doug-Dennis flies higher, until he's floating in a land of lies--some of them big, some small, and some just downright weird. Doug-Dennis misses his best friend, and realizes there's only one way to come back down: by finally telling the truth. Darren Farrell, a bright new talent in picture books, has created a cautionary tale that's chock-full of hilarity. This charming sheep is sure to become a favorite. (And that's the truth.)
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
These are the papers presented at the Fib-RILEM workshop held in Madrid, Spain, in November 2010. The assessment of deterioration and aging of concrete structures, most commonly through reinforcement corrosion, is not considered in current structural codes or standards. Some guidelines manuals exist, and research has been done, but there is as yet no accepted methodology nor models that could be used by engineers. This book deals with all aspects related to modelling of corroding structures and provides state-of-the-art information on structural models for corroding structures.
Segmental concrete bridges have become one of the main options for major transportation projects world-wide. They offer expedited construction with minimal traffic disruption, lower life cycle costs, appealing aesthetics and adaptability to a curved roadway alignment. The literature is focused on construction, so this fills the need for a design-oriented book for less experienced bridge engineers and for senior university students. It presents comprehensive theory, design and key construction methods, with a simple design example based on the AASHTO LRFD Design Specifications for each of the main bridge types. It outlines design techniques and relationships between analytical methods, specifications, theory, design, construction and practice. It combines mathematics and engineering mechanics with the authors ' design and teaching experience.
Crafting Interpreters
Strut-and-Tie Models for Unified Design
The Book of R
and Other Stories
The Big Fib
fib Model Code for Concrete Structures 2010
First published in 1202, Fibonacci's Liber Abaci was one of the most important books on mathematics in the Middle Ages, introducing Arabic numerals and methods throughout Europe. This is the first translation into a modern European language, of interest not only to historians of science but also to all mathematicians and mathematics teachers interested in the origins of their methods.
The purpose of this recommendation - fib Bulletin 75: Polymer-duct systems for internal bonded post-tensioning - is to update and amend fib Bulletin 7:Corrugated plastic ducts for internal bonded post-tensioning, a technical report published in 2000. fib Bulletin 75 is meant as a cornerstone for the technical approval of polymer (plastic) ducts for internal bonded post-tensioning and possibly for the test procedures of a future testing standard. The updated bulletin includes new information on the design and detailing of concrete structures containing tendons with polymer ducts. The recommendation provides detailed test specifications for polymer materials, duct components and duct systems. In addition, the report contains recommendations for approval testing and attestations of conformity for polymer-duct systems. Although the new generation of corrugated polymer ducts for bonded post-tensioning have now been around for approximately twenty years, products still differ in material properties, geometrical detail, installation procedures and on-site use. Unlike corrugated steel ducts or smooth polyethylene (PE) pipes, they have not yet become standardized. It is the opinion of fib Task Group 9.16 and Commission 9 that these plastic ducts should, therefore, still be subjected to a systems approval process. This recommendation offers information acquired from twenty years of experience as well as new specifications that will, hopefully, lead to the standardization of polymer-duct systems.
Precast reinforced and prestressed concrete frames provide ahigh strength, stable, durable and robust solution for anymulti-storey structure, and are widely regarded as a high quality,economic and architecturally versatile technology for theconstruction of multi-storey buildings. The resulting buildingssatisfy a wide range of commercial and industrial needs. Precastconcrete buildings behave in a different way to those where theconcrete is cast in-situ, with the components subject to differentforces and movements. These factors are explored in detail in thesecond edition of Multi-Storey Precast Concrete FramedStructures, providing a detailed understanding of theprocedures involved in precast structural design. This new editionhas been fully updated to reflect recent developments, and includesmany structural calculations based on EUROCODE standards. These areshown in parallel with similar calculations based on BritishStandards to ensure the designer is fully aware of the differencesrequired in designing to EUROCODE standards. Civil and structural engineers as well as final year undergraduateand postgraduate students of civil and structural engineering willall find this book to be thorough overview of this importantconstruction technology.
This volume highlights the latest advances, innovations, and applications in the field of fibre-reinforced concrete (FRC), as presented by scientists and engineers at the RILEM-fib X International Symposium on Fibre Reinforced Concrete (BEFIB), held in Valencia, Spain, on September 20-22, 2021. It discusses a diverse range of topics concerning FRC: technological aspects, nanotechnologies related with FRC, mechanical properties, long-term properties, analytical and numerical models, structural design, codes and standards, quality control, case studies, Textile-Reinforced Concrete, Geopolymers and UHPFRC. After the

symposium postponement in 2020, this new volume concludes the publication of the research works and knowledge of FRC in the frame of BEFIB from 2020 to 2021 with the successful celebration of the hybrid symposium BEFIB 2021. The contributions present traditional and new ideas that will open novel research directions and foster multidisciplinary collaboration between different specialists.

LarryBoy and the Fib from Outer Space!

Recommendation

Guide to good practice

Fibonacci ' s Liber Abaci

Guidelines for the Design of Footbridges

Doug-Dennis and the Flyaway Fib

After hearing about the exciting summer vacations of his classmates, Arthur decides to write an embellished version of his own summer experiences. Simultaneous.

JUNIOR ASPARAGUS IS in a pickle! After he breaks his dad's favorite bowling plate, a strange creature named Fib shows up and convinces him to lie about it. Junior is happy that his dad doesn't punish him, but now Fib seems to be growing! Before long, Junior's "little fib" becomes a 30-foot-tall monster, threatening all of Bumblyburg. Fortunately, LarryBoy, the superheroic cucumber, is there to save the day. This lesson in telling the truth, based on the bestselling DVD LarryBoy and the Fib from Outer Space!, is retold in a full-color Little Golden Book.

Wow! A boy finds some humongous boxes outside. He and his dog use them to make a train that goes far, far, far; a race car that goes fast, fast, fast; and a plane that goes up, up, up. Litter is everywhere, and the boy blames the wind. But as he watches his elderly neighbor clean up his mess, the boy knows what he must do. Truth triumphs and the boy's honesty is rewarded with forgiveness, friendship, and cookies. An I Like to Read(R) book. Guided Reading Level E.

The Model Code for Concrete Structures is intended to serve as a basis for future codes. It takes into account new developments with respect to concrete structures, the structural material concrete and new ideas for the requirements to be formulated for structures in order to achieve optimum behaviour according to new insights and ideas. It is also intended as a source of information for updating existing codes or developing new codes for concrete structures. At the same time, the Model Code is intended as an operational document for normal design situations and structures.

Stuff They Don't Want You to Know

Manual for Detailing Reinforced Concrete Structures to EC2

Technical Report

Proceedings of the Joint fib-RILEM Workshop held in Madrid, Spain, 22–23 November 2010

Concrete Structures

Tunnels and Underground Cities. Engineering and Innovation Meet Archaeology, Architecture and Art

fib Bulletin 61 is a continuation of fib Bulletin 16 (2002). Again the bulletin's main objective is to demonstrate the application of the FIP Recommendations "Practical Design of Structural Concrete", and especially to illustrate the use of strut-and-tie models to design discontinuity regions (D-regions) in concrete structures. Bulletin 61 presents 14 examples, most of which are existing structures built in recent years. Although some of the presented structures can be considered to be quite important and, in some instances, complex, the chosen examples are not intended to be exceptional. The main aim is to look at specific design aspects, by selecting D-regions of the presented structures that are designed and detailed according to the proposed design principles and specifications for the use of strut-and-tie models. Two papers at the end of the bulletin deal with the role of concrete tension fields in modelling with strut-and-tie models, and summarize the experiences gained by the Working Group in applying strut-and-tie models to the examples in the bulletin. It is hoped that fib Bulletin 61 will be of interest to engineers involved in the design of concrete structures, supporting the use of more consistent design and detailing tools such as strut-and-tie models.

This beautifully illustrated picture book tells the story of a

The objectives of MC2010 are to (a) serve as a basis for future codes for concrete structures, and (b) present new developments with regard to concrete structures, structural materials and new ideas in order to achieve optimum behaviour. MC2010 includes the whole life cycle of a concrete structure, from design and construction to conservation (assessment, maintenance, strengthening) and dismantlement, in one code for buildings, bridges and other civil engineering structures. Design is largely based on performance requirements. The chapter on materials is extended with new types of concrete and reinforcement (such as fibres and non-metallic reinforcements). The fib Model Code 2010 also gives corresponding explanations in a separate column of the document. Additionally, MC2010 is supported by background documents that have already been (or will soon be) published in fib bulletins and journal articles. MC2010 is now the most comprehensive code on concrete structures, including their complete life cycle: conceptual design, dimensioning, construction, conservation and dismantlement.

For a large part of the existing buildings and infrastructure the design life has been reached or will be reached in the near future. These structures might need to be reassessed in order to investigate whether the safety requirements are met. Current practice on the assessment of existing concrete structures however needs a thorough evaluation from a risk and reliability point of view, as they are mostly verified using simplified procedures based on the partial factor method commonly applied in design of new structures. Such assessments are often conservative and may lead to expensive upgrades. Although the last decades reliability-based assessment of existing concrete structures has gained wide attention in the research field, a consistent reliability-based assessment framework and a practically applicable codified approach which is compatible with the Eurocodes and accessible for common structural engineering problems in everyday

practice is currently missing. Such an approach however allows for a more uniform, more objective and probably more widely applied assessment approach for existing concrete structures. Hence, in this bulletin two different partial factor formats are elaborated, i.e. the Design Value Method (DVM) and the Adjusted Partial Factor Method (APFM), enabling the incorporation of specific reliability related aspects for existing structures. The DVM proposes a fundamental basis for evaluating partial factors whereas the APFM provides adjustment factors to be applied on the partial factors for new structures in EN 1990. In this bulletin both methods are elaborated and evaluated and a basis is provided for decision making regarding the target safety level of existing structures.

Beat Your A-Fib: The Essential Guide to Finding Your Cure

Model code for seismic design of concrete structures vol1 final draft

Model Code for Service Life Design

High Tech Concrete: Where Technology and Engineering Meet

Structural Concrete

A Translation into Modern English of Leonardo Pisano's Book of Calculation

In December 1996, CEB established a Task Group with the main objective to elaborate design guidelines for the use of FRP reinforcement in accordance with the design format of the CEB-FIP Model Code and Eurocode2. With the merger of CEB and FIP into fib in June 1998, this Task Group became fib TG 9.3 FRP Reinforcement for concrete structures in Commission 9 Reinforcing and Prestressing Materials and Systems. Finally, as a result of the restructuring of fib's Commissions and Task Groups at the end of 2014, the Task Group became fib T5.1 FRP Reinforcement for concrete structures, chaired by Stijn Matthys at Ghent University, in Commission 5 Reinforcements. The work of former TG 9.3 and current T5.1 was performed by two working parties (WP), one of which is "Externally Applied Reinforcement" (EAR), which produced fib bulletin 14 "Externally bonded FRP reinforcement for RC structures" in July 2001. Following a number of years of relatively slow activity, the WP on externally applied reinforcement was reactivated and started working on an update of bulletin 14. The result of this work is summarised in the present technical report, which aims to give design guidelines on the use of externally applied FRP reinforcement (both externally bonded and near-surface mounted) for concrete structures. An attempt has been made to present some of the topics in a Eurocode-compatible format, so that the material covered may form the basis for the introduction of composites in the next version of Eurocode 2 and for the updating of the text on seismic retrofitting with composites in the next version of Eurocode 8. All persons who participated in the preparation of this Bulletin are mentioned in the copyright page. Further acknowledgements are due to Josée Bastien (Canada), Hans Rudolf Ganz (Switzerland) and Luc Taerwe (Belgium) for revision of the document. To all members of the working party on externally applied reinforcement our sincere thanks are expressed for the high quality and extensive work brought in on a voluntary basis.

The intention of fib Bulletin 32 is to present guidelines for the design of footbridges as well as bridges accommodating cyclists and bridleways (equestrian paths). The need for these guidelines comes from the fact that structural engineers designing footbridges currently have to spend considerable time and energy collecting information from numerous documents, codes and recommendations to make design decisions. There seems to be no international document dedicated solely to the design of footbridges. These guidelines attempt to provide a concentrated source of information regarding all design issues specific to footbridges. It is meant to be a 'liberal' document in the sense that it promotes new, innovative and bold yet prudent designs by sharing the experience of the authors, summarizing specifications given in codes, and presenting a collection of examples of well-designed structures or structural details from around the world. It is not intended to be an international code that specifies limits and admissible values, thus encouraging timid, conservative designs that are repetitions of approved and tested designs. Indeed, it may be the very fact that no international code exists specifically for footbridges that encourages the wide variety of footbridge designs found today. It should be noted that numerous guidelines, codes and books have been published on bridge design in general. Information given in those publications that is also applicable to footbridges is not repeated in Bulletin 32. The chapters of these guidelines all follow the same pattern: an introduction to the subject, general guidelines as well as do's and don'ts; a summary of information found in existing international codes, recommendations, experience of the authors, and built examples with comparison and comments on this information; examples. Plenty of illustrations and photographs help to visualize the themes of this work. The last chapter, 'Case Studies', contains footbridges each with a short summary of main structural data and references for further reading.

The concept of precast segmental bridges is not new: the first application documented was from the mid-1940s, designed by Eugene Freyssinet and built over the river Marne near Luzancy in France, between 1944 and 1946. Although innovative, it also contained traditional wet concrete joints between the members. The impressive breakthrough came slightly later with the introduction of match-cast joints by Jean Muller, first for a bridge near Buffalo (USA) in 1952, and later for a bridge across the River Seine at Choisy le Roi near Paris in 1962. This opened the way for a large number of new developments in terms of design, production approaches and construction techniques, and precast prestressed concrete segmental construction became rapidly one of the most efficient and successful bridge construction methods all over the world. These developments are still evolving, but the interaction between design, production and construction is a critical factor for success: the interaction creates opportunities to optimise the scheme, but at the same time is crucial to ensure safety, especially during construction, when large weights are moved, placed and secured, frequently at substantial heights. Engineers of all disciplines involved should interact during the development and realisation of precast segmental bridge (PSB) schemes, to conclude the optimum method statement and consequently check all the intermediate steps of the method statement in terms of stress, stiffness, stability, production and constructability. With the ongoing development of the PSB concept, and consequently moving limits in terms of dimensions, it was concluded to be

appropriate to develop a Guide to good practice for the PSB construction method. The present report was developed by an integrated team of engineers with roots in design, structural engineering, production and construction, and provides a valuable source of knowledge, experience, recommendations and examples, with particular emphasis on the fib Model Code for Concrete Structures 2010 and fib Bulletins 20, 33, 48 and 75. I would like to thank all the members of Task Group 1.7, all the individual contributors from outside Task Group 1.7, and the reviewers of the Technical Council of the fib for their contribution to this Guide to good practice. In particular, I would like to thank Gopal Srinivasan and Marcos Sanchez, who, apart from their own contributions, did the final editorial work for this bulletin.

Theory, Design, and Construction to AASHTO LRFD Specifications

Fib Model Code for Concrete Structures 2010

Model Code

Protection, Repair and Rehabilitation

X RILEM-fib International Symposium on Fibre Reinforced Concrete (BEFIB) 2021

Design Examples for Strut-and-tie Models