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Concrete Structures Subjected to Impact and Blast Loadings and Their Combinations Chunwei Zhang
2022-05-09 Although much research focuses on investigating the responses of reinforced concrete (RC) structures under sole impact or blast loads, the responses of RC structures under a combination of impact and blast loads currently represent a gap in our knowledge. The combined actions of impact and blast loadings may be applied to RC structures during accidental or intentional collision of vessels, vehicles, etc., carrying explosive materials. A comprehensive study on the vulnerability of various structural members is carried out using finite element (FE) simulations under combination of impact and blast loads with the variations of various loading- and structural-related parameters and key parameters. This book introduces various structural analysis approaches for concrete structures when subjected to extreme loads such as impact and blast loadings. The theory of the combinations of impact and blast loads is proposed that can provide primary insights to the specific readers to develop new ideas in impact and blast engineering, including combined actions of extreme loads arising from real-world intentional or accidental events. This book will be of value to students (undergraduate or postgraduate), engineers, and researchers in structural and civil engineering, and specifically, those who are studying and investigating the performances of concrete structures under extreme loads.

Innovative Materials and Techniques in Concrete Construction Michael N. Fardis 2011-10-05 Recent years have seen enormous advances in the technology of concrete as a material, through which its strength, compactness and ductility can reach levels never dreamed of before. Thanks to these improved material properties, the strength and durability of concrete structures is greatly improved, their weight and dimensions reduced, the scope of concrete as a structural material is widened and – despite the higher material costs – overall economy is possible, with positive impacts on sustainability as well. Similar advances are underway in reinforcing materials, notably high strength steel and fibre-reinforced polymers, and in the way they are combined with concrete into high performance structures. Developments in materials and equipment, as well as new concepts, have lead to innovative construction techniques, reducing cost and construction time and making possible the application of concrete under extreme conditions of construction or environment. All these advances will be highlighted in the book by the top experts in the field of concrete structures, namely those currently active in the field’s leading and truly international scientific and technical association: the

International Federation of Structural Concrete (fib) www.fib-international.org. Audience: Practicing engineers and firms, academics, researchers and graduate students, will all find the book timely, informative and very interesting.

Proceedings fib Symposium in Athens Greece FIB – International Federation for Structural Concrete
2003-05-01

Experimental and Analytical Evaluation of FRP-confined Large Size Reinforced Concrete Columns Silvia Rocca 2007 "Fiber Reinforced Polymer (FRP) jacketing of Reinforced Concrete (RC) columns, as a rapidly growing strengthening technique, requires appropriate design methods. However, the current available design guides are based on models, in their majority semi-empirical, and calibrated with small-scale plain concrete specimens. These models might not be reliable in predicting the strength and ductility enhancement sought through FRP-confinement in RC columns with geometric and material properties as found in practice. This dissertation presents the research conducted in three technical papers. In the first paper, the performance of 22 FRP-wrapped RC columns of medium- and large-scale is studied. The results of the experimental campaign were used to develop and evaluate an analytical method to determine the confining pressure and compressive capacity in a non-circular column ... A second paper is devoted to the review of state-of-the-art design methodologies available for the case of FRP-confined RC columns, and their ability to predict the increment of compressive strength and ductility ... a third paper address the subject of FRP-confined RC columns subjected to combined axial load and bending moment"--Abstract, p. iv.

Design Procedures for the Use of Composites in Strengthening of Reinforced Concrete Structures Carlo Pellegrino 2015-08-25 This book analyses the current knowledge on structural behaviour of RC elements and structures strengthened with composite materials (experimental, analytical and numerical approaches for EBR and NSM), particularly in relation to the above topics, and the comparison of the predictions of the current available codes/recommendations/guidelines with selected experimental results. The book shows possible critical issues (discrepancies, lacunae, relevant parameters, test procedures, etc.) related to current code predictions or to evaluate their reliability, in order to develop more uniform methods and basic rules for design and control of FRP strengthened RC structures. General problems/critical issues are clarified on the basis of the actual experiences, detect discrepancies in existing codes, lacunae in knowledge and, concerning these identified subjects, provide proposals for improvements. The book will help to contribute to promote and consolidate a more qualified and conscious approach towards rehabilitation and strengthening existing RC structures with composites and their possible monitoring.

Proceedings fib Symposium in Stuttgart FIB – International Federation for Structural Concrete 2008-09-01

Advances in Earthquake Engineering for Urban Risk Reduction S. Tanvir Wasti 2006-06-15 Earthquakes affecting urban areas can lead to catastrophic situations and hazard mitigation requires preparatory measures at all levels. Structural assessment is the diagnosis of the seismic health of buildings. Assessment is the prelude to decisions about rehabilitation or even demolition. The scale of the problem in dense urban settings brings about

a need for macro seismic appraisal procedures because large numbers of existing buildings do not conform to the increased requirements of new earthquake codes and specifications or have other deficiencies. It is the vulnerable buildings - liable to cause damage and loss of life - that need immediate attention and urgent appraisal in order to decide if structural rehabilitation and upgrading are feasible. Current economic, efficient and occupant-friendly rehabilitation techniques vary widely and include the application either of precast concrete panels or layers, strips and patches of fiber reinforced polymers (FRP) in strategic locations. The papers in this book, many by renowned authorities in earthquake engineering, chart new and vital directions of research and application in the assessment and rehabilitation of buildings in seismic regions. While several papers discuss the probabilistic prediction and quantification of structural damage, others present approaches related with the in-situ and occupant friendly upgrading of buildings and propose both economical and practical techniques to address the problem.

Revolutionary Materials Sampe 2000-11-06

CONCRETE Innovations in Materials, Design and Structures FIB – International Federation for Structural Concrete 2019-05-27 This Proceedings contains the papers of the fib Symposium “CONCRETE Innovations in Materials, Design and Structures”, which was held in May 2019 in Kraków, Poland. This annual symposium was co-organised by the Cracow University of Technology. The topics covered include Analysis and Design, Sustainability, Durability, Structures, Materials, and Prefabrication. The fib, Fédération internationale du béton, is a not-for-profit association formed by 45 national member groups and approximately 1000 corporate and individual members. The fib’s mission is to develop at an international level the study of scientific and practical matters capable of advancing the technical, economic, aesthetic and environmental performance of concrete construction. The fib, was formed in 1998 by the merger of the Euro-International Committee for Concrete (the CEB) and the International Federation for Prestressing (the FIP). These predecessor organizations existed independently since 1953 and 1952, respectively.

Proceedings of the First International Conference on Theoretical, Applied and Experimental Mechanics

Emmanuel E. Gdoutos 2018-05-26 ICTAEM_1 treated all aspects of theoretical, applied and experimental mechanics including biomechanics, composite materials, computational mechanics, constitutive modeling of materials, dynamics, elasticity, experimental mechanics, fracture, mechanical properties of materials, micromechanics, nanomechanics, plasticity, stress analysis, structures, wave propagation. During the conference special symposia covering major areas of research activity organized by members of the Scientific Advisory Board took place. ICTAEM_1 brought together the most outstanding world leaders and gave attendees the opportunity to get acquainted with the latest developments in the area of mechanics. ICTAEM_1 is a forum of university, industry and government interaction and serves in the exchange of ideas in an area of utmost scientific and technological importance.

Seismic Assessment and Rehabilitation of Existing Buildings S. Tanvir Wasti 2012-12-06 The present volume contains a total of 23 papers centred on the research area of Seismic Assessment and Rehabilitation of Existing Buildings. This subject also forms the core of Project SfP977231, sponsored by the NATO Science for Peace

Office and supported by the Scientific and Technical Research Council of Turkey [TUBIT AK]. Most of these papers were presented by the authors at a NATO Science for Peace Workshop held in Izmir on 13 - 14 May, 2003 and reflect a part of their latest work conducted within the general confines of the title of the NATO Project. Middle East Technical University, Ankara, Turkey serves as the hub of Project SfP977231 and coordinates research under the project with universities within Turkey, e. g. Istanbul Technical University and Kocaeli University, and with partner institutions in Greece and the Former Yugoslav Republic of Macedonia: A few articles have also been contributed by invited experts, who are all noted researchers in the field. Altogether, the contents of the volume deal with a vast array of problems in Seismic Assessment and Rehabilitation and cover a wide range of possible solutions, techniques and proposals. It is intended to touch upon many of these aspects separately below. Earthquakes constitute possibly the most widely spread and also the most feared of natural hazards. Recent earthquakes within the first six months of 2003, such as the Bingol Earthquake in Turkey and the Algerian earthquake, have caused both loss of life and severe damage to property.

Advanced fibre-reinforced polymer (FRP) composites for structural applications M.F.M. Fahmy 2013-09-30 To ensure better performance for a range of existing reinforced concrete structures in seismic regions with substandard structural details, seismic retrofit is an economical solution. Hence, this chapter presents some of the available results in which fiber-reinforced polymer (FRP) composites can be used for damage-controllable structures. For example, the performance of existing reinforced concrete structures whose components are vulnerable to shear failure, flexural-compression failure, joint reinforcement bond failure, or longitudinal reinforcement lap splice failure and retrofitted with FRPs is described. Novel concepts of modern constructions with controllability and recoverability using FRP composites are addressed.

Structural Integrity of RC Columns Wrapped with FRP Sheet Subjected to Various Environmental Conditions Including Corrosion 2004 Although the short-term performance of reinforced concrete (RC) columns wrapped with fiber reinforced polymer (FRP) composite materials has been widely studied, research studies on the long-term performance are limited. The objective of this study was to evaluate the effects of various environmental conditions on the long-term behavior of RC columns wrapped with FRP sheets. The experimental program comprised two parts - ambient environmental effect tests and corrosion tests. The environmental conditions considered in the ambient environmental tests included (1) freeze-thaw cycles, (2) high-temperature cycles, (3) high-humidity cycles, (4) ultraviolet (UV) radiation, and (5) saline solution; while the corrosion tests dealt with the corrosion of steel reinforcement embedded in RC columns wrapped with FRP sheets. RC columns were wrapped with carbon fiber reinforced polymer (CFRP) sheets and glass fiber reinforced polymer (GFRP) sheets and conditioned under the environmental conditions listed. After the environmental conditioning, uni-axial compression tests were conducted in order to evaluate the effects on the mechanical properties, such as column capacity, stiffness, and ductility.

SAMPE Symposium and Exhibition Linas Repecka 2001

Seismic Assessment and Retrofit of Reinforced Concrete Columns Konstantinos G. Megalooikonomou

2019-02-27 Reinforced concrete columns play a very important role in structural performance. As such, it is essential to apply a suitable analytical tool to estimate their structural behaviour considering all failure mechanisms such as axial, shear, and flexural failures. This book highlights the development of a fiber beam-column element accounting for shear effects and the effect of tension stiffening through reinforcement-to-concrete bond, along with the employment of suitable constitutive material laws.

10th International Conference on FRP Composites in Civil Engineering Alper Ilki 2021-11-26 This volume highlights the latest advances, innovations, and applications in the field of FRP composites and structures, as presented by leading international researchers and engineers at the 10th International Conference on Fibre-Reinforced Polymer (FRP) Composites in Civil Engineering (CICE), held in Istanbul, Turkey on December 8-10, 2021. It covers a diverse range of topics such as All FRP structures; Bond and interfacial stresses; Concrete-filled FRP tubular members; Concrete structures reinforced or pre-stressed with FRP; Confinement; Design issues/guidelines; Durability and long-term performance; Fire, impact and blast loading; FRP as internal reinforcement; Hybrid structures of FRP and other materials; Materials and products; Seismic retrofit of structures; Strengthening of concrete, steel, masonry and timber structures; and Testing. The contributions, which were selected by means of a rigorous international peer-review process, present a wealth of exciting ideas that will open novel research directions and foster multidisciplinary collaboration among different specialists.

Composites Science, Technology, and Engineering Frank R. Jones 2022-04-21 Understand critical principles of composites with this interdisciplinary text. Covering such topics as design of durable structures, choice of fibre, matrix, manufacturing process and mechanics, it is an essential guide for scientists and engineers wishing to discover the benefits of composite materials for designing strong and durable structures.

PROCEEDINGS OF THE CANADIAN SOCIETY OF CIVIL ENGINEERING ANNUAL CONFERENCE Canadian Society of Civil Engineers. Annual Conference 2022 This book comprises the proceedings of the Annual Conference of the Canadian Society of Civil Engineering 2021. The contents of this volume focus on specialty conferences in construction, environmental, hydrotechnical, materials, structures, transportation engineering, etc. This volume will prove a valuable resource for those in academia and industry.

2nd fib Congress in Naples Italy Vol1 FIB – International Federation for Structural Concrete 2006-06-01

Techniques for the Seismic Rehabilitation of Existing Buildings Federal Emergency Management Agency 2006-10 Illustrated in full color throughout. The primary purpose of this document is to provide a selected compilation of seismic rehabilitation techniques that are practical and effective. The descriptions of techniques include detailing and constructability tips that might not be otherwise available to engineering offices or individual structural engineers who have limited experience in seismic rehabilitation of existing buildings. A secondary purpose is to provide guidance on which techniques are commonly used to mitigate specific seismic deficiencies in various model building types.

Advanced Composites in Bridge Construction and Repair Yail Jimmy Kim 2014-05-16 Advanced composite materials for bridge structures are recognized as a promising alternative to conventional construction materials such as steel. After an introductory overview and an assessment of the characteristics of bonds between composites and quasi-brittle structures, *Advanced Composites in Bridge Construction and Repair* reviews the use of advanced composites in the design and construction of bridges, including damage identification and the use of large rupture strain fiber-reinforced polymer (FRP) composites. The second part of the book presents key applications of FRP composites in bridge construction and repair, including the use of all-composite superstructures for accelerated bridge construction, engineered cementitious composites for bridge decks, carbon fiber-reinforced polymer composites for cable-stayed bridges and for repair of deteriorated bridge substructures, and finally the use of FRP composites in the sustainable replacement of ageing bridge superstructures. *Advanced Composites in Bridge Construction and Repair* is a technical guide for engineering professionals requiring an understanding of the use of composite materials in bridge construction. Reviews key applications of fiber-reinforced polymer (FRP) composites in bridge construction and repair Summarizes key recent research in the suitability of advanced composite materials for bridge structures as an alternative to conventional construction materials

Dynamic Response of Infrastructure to Environmentally Induced Loads Anastasios G. Sextos 2017-05-29 This book provides state of the art coverage of important current issues in the analysis, measurement, and monitoring of the dynamic response of infrastructure to environmental loads, including those induced by earthquake motion and differential soil settlement. The coverage is in five parts that address numerical methods in structural dynamics, soil–structure interaction analysis, instrumentation and structural health monitoring, hybrid experimental mechanics, and structural health monitoring for bridges. Examples that give an impression of the scope of the topics discussed include the seismic analysis of bridges, soft computing in earthquake engineering, use of hybrid methods for soil–structure interaction analysis, effects of local site conditions on the inelastic dynamic analysis of bridges, embedded models in wireless sensor networks for structural health monitoring, recent developments in seismic simulation methods, and seismic performance assessment and retrofit of structures. Throughout, the emphasis is on the most significant recent advances and new material. The book comprises extended versions of contributions delivered at the DE-GRIE Lab Workshop 2014, held in Thessaloniki, Greece, in November 2014.

Concrete Composite Columns Chong Rong 2022-12-09 *Concrete Composite Columns: Behavior and Design* focuses on confined concrete and establishes analytical methods for each composite column. The volume moves beyond existing resources to study the relationship between existing composite structures and design methods for the sectional form of a concrete composite structure. Chapters cover the failure criteria of concrete, confined concrete types, models, including axial stress prediction, analysis and design-oriented constitutive models, the design and analysis of section form, axial and seismic behaviors of concrete composite columns, the seismic design of concrete composite columns, and the engineering application. This book offers a practical solution to students, researchers, and engineers working with both steel and FRP-confined concrete composite columns. Focuses on confined concrete and provides analytical methods for composite columns Discusses different types of composite columns, including FRP and steel-concrete composites Considers the construction method and

confining forces in composite concrete columns Details confined concrete from basic theoretical analysis to seismic behaviors and design methods Provides a solution to students, researchers, and engineers working with confined composite columns

Blast Protection of Buildings American Society of Civil Engineers 2011 Blast Protection of Buildings provides minimum requirements for planning, design, construction, and assessment of new and existing buildings subject to the effects of accidental or malicious explosions. The Standard includes principles for establishing appropriate threat parameters, levels of protection, loadings, analysis methodologies, materials, detailing, and test procedures. It provides a comprehensive presentation of current practice in the analysis and design of structures for blast resistance. Commentaries on the requirements are also included. The Standard supplements existing building codes, standards, and laws, but is not intended to replace them.

Proceedings of the American Society for Composites 2014-Twenty-ninth Technical Conference on Composite Materials Hyonny Kim 2014-09-17 New and not previously published U.S. and international research on composite and nanocomposite materials Focus on health monitoring/diagnosis, multifunctionality, self-healing, crashworthiness, integrated computational materials engineering (ICME), and more Applications to aircraft, armor, bridges, ships, and civil structures This fully searchable CD-ROM contains 270 original research papers on all phases of composite materials, presented by specialists from universities, NASA and private corporations such as Boeing. The document is divided into the following sections: Aviation Safety and Aircraft Structures; Armor and Protection; Multifunctional Composites; Effects of Defects; Out of Autoclave Processing; Sustainable Processing; Design and Manufacturing; Stability and Postbuckling; Crashworthiness; Impact and Dynamic Response; Natural, Biobased and Green; Integrated Computational Materials Engineering (ICME); Structural Optimization; Uncertainty Quantification; NDE and SHM Monitoring; Progressive Damage Modeling; Molecular Modeling; Marine Composites; Simulation Tools; Interlaminar Properties; Civil Structures; Textiles. The CD-ROM displays figures and illustrations in articles in full color along with a title screen and main menu screen. Each user can link to all papers from the Table of Contents and Author Index and also link to papers and front matter by using the global bookmarks which allow navigation of the entire CD-ROM from every article. Search features on the CD-ROM can be by full text including all key words, article title, author name, and session title. The CD-ROM has Autorun feature for Windows 2000 or higher products and can also be used with Macintosh computers. The CD includes the program for Adobe Acrobat Reader with Search 11.0. One year of technical support is included with your purchase of this product.

Fifth International PhD Symposium in Civil Engineering Joost Walraven 2004

Service Life Estimation and Extension of Civil Engineering Structures Vistasp M. Karbhari 2010-12-20 Service life estimation is an area of growing importance in civil engineering both for determining the remaining service life of civil engineering structures and for designing new structural systems with well-defined periods of functionality. Service life estimation and extension of civil engineering structures provides valuable information on the development and use of newer and more durable materials and methods of construction, as well as the development and use of new techniques of estimating service life. Part one discusses using fibre

reinforced polymer (FRP) composites to extend the service-life of civil engineering structures. It considers the key issues in the use of FRP composites, examines the possibility of extending the service life of structurally deficient and deteriorating concrete structures and investigates the uncertainties of using FRP composites in the rehabilitation of civil engineering structures. Part two discusses estimating the service life of civil engineering structures including modelling service life and maintenance strategies and probabilistic methods for service life estimation. It goes on to investigate non-destructive evaluation and testing (NDE/NDT) as well as databases and knowledge-based systems for service life estimation of rehabilitated civil structures and pipelines. With its distinguished editors and international team of contributors Service life estimation and extension of civil engineering structures is an invaluable resource to academics, civil engineers, construction companies, infrastructure providers and all those with an interest in improving the service life, safety and reliability of civil engineering structures. A single source of information on the service life of reinforced concrete and fibre-reinforced polymer (FRP) rehabilitated structures Examines degradation mechanisms in composites for rehabilitation considering uncertainties in FRP reliability Provides an overview of probabilistic methods for rehabilitation and service life estimation of corroded structures

Analytical Approaches for Reinforced Concrete Yufei Wu 2022-04-16 Analytical Approaches for Reinforced Concrete presents mathematically-derived theories and equations for RC design and construction. The book applies deductive reasoning, logic and mathematics to RC. Laying out, deductively, the principles of RC, it encourages researchers to re-imagine and innovate using a solid conceptual framework. Sections consider the reasoning behind key theories, as well as problems that remain unsolved. The title presents key ideas in simple language and illustrates them clearly to help the reader grasp difficult concepts and develop a solid foundation, grounded in mathematics, for further study and research. The book is future-oriented, demonstrating theories that are applicable not only to conventional reinforced concrete members, but also to the envisaged structures of tomorrow. Such developments will increasingly require a deep, deductive understanding of RC. This title is the first of its kind, presenting a fresh analytical approach to reinforced concrete design and construction. Takes an analytical approach to reinforced concrete using mathematics and deduction Lays out the reasoning behind key theories and models in reinforced concrete design and construction Encourages researchers-new and established- to re-imagine and innovate using a solid conceptual framework Presents difficult concepts that are clearly and analytically presented with accompanying illustrations Looks forward to the use of reinforced concrete in the complex structures of the future

Green Building with Concrete Gajanan M. Sabnis 2015-06-16 Illustrates the Global Relevance of Sustainability Applicable to roads, bridges, and other elements of the infrastructure, Green Building with Concrete: Sustainable Design and Construction, Second Edition provides an overview of all available information on the role of concrete in green building. A handbook offering viewpoints from worldwide experts

Seismic Assessment and Retrofit of Reinforced Concrete Buildings fib Fédération internationale du béton 2003-08-01 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

Challenges, Opportunities and Solutions in Structural Engineering and Construction Nader Ghafoori 2009-10-29
Challenges, Opportunities and Solutions in Structural Engineering and Construction addresses the latest developments in innovative and integrative technologies and solutions in structural engineering and construction, including: Concrete, masonry, steel and composite structures; Dynamic impact and earthquake engineering; Bridges and

Application of Fiber Reinforced Polymer Composites to the Highway Infrastructure Dennis R. Mertz 2003
Rising awareness of and increased attention to sexual harassment has resulted in momentum to implement sexual harassment prevention efforts in higher education institutions. Work on preventing sexual harassment is an area that has recently garnered a lot of attention, especially around education and programs that go beyond the standard anti-sexual harassment trainings often used to comply with legal requirements. On April

20-21, 2021, the National Academies of Sciences, Engineering, and Medicine hosted the workshop *Developing Evaluation Metrics for Sexual Harassment Prevention Efforts*. The workshop explored approaches and strategies for evaluating and measuring the effectiveness of sexual harassment interventions being implemented at higher education institutions and research and training sites, in order to assist institutions in transforming promising ideas into evidence-based best practices. Workshop participants also addressed methods, metrics, and measures that could be used to evaluate sexual harassment prevention efforts that lead to change in the organizational climate and culture and/or a change in behavior among community members. This publication summarizes the presentations and discussion of the workshop.

Structures Strengthened with Bonded Composites Zhishen Wu 2020-07-15 *Structures Strengthened with Bonded Composites* presents a comprehensive resource on the strengthening of concrete, reinforced and prestressed concrete, masonry, steel and other composite structures using externally-bonded FRP composites. The book emphasizes a systematic and fundamental investigation on bonding and debonding behavior of the FRP-concrete interface and structural performances of FRP-strengthened structures with a combination of experimental, theoretical and numerical studies. This book will appeal to all those concerned with strengthening and retrofitting of existing structures from the effect of additional anticipated loads in the civil sector. Discusses the FRP strengthening of different types of structures, including bridges, tunnels, buildings, historic structures and underwater constructions Establishes a systematic theory on interfacial fracture mechanics and clarifies different debonding mechanisms Describes design methods and makes comparison of design considerations and methods among different countries Presents temperature and fatigue effects and long-term behavior for different strengthening methods

Computer Aided Seismic and Fire Retrofitting Analysis of Existing High Rise Reinforced Concrete Buildings Raja Rizwan Hussain 2015-08-13 This book details the analysis and design of high rise buildings for gravity and seismic analysis. It provides the knowledge structural engineers need to retrofit existing structures in order to meet safety requirements and better prevent potential damage from such disasters as earthquakes and fires. Coverage includes actual case studies of existing buildings, reviews of current knowledge for damages and their mitigation, protective design technologies, and analytical and computational techniques. This monograph also provides an experimental investigation on the properties of fiber reinforced concrete that consists of natural fibres like coconut coir and also steel fibres that are used for comparison in both Normal Strength Concrete (NSC) and High Strength Concrete (HSC). In addition, the authors examine the use of various repair techniques for damaged high rise buildings. The book will help upcoming structural design engineers learn the computer aided analysis and design of real existing high rise buildings by using ACI code for application of the gravity loads, UBC- 97 for seismic analysis and retrofitting analysis by computer models. It will be of immense use to the student community, academicians, consultants and practicing professional engineers and scientists involved in the planning, design, execution, inspection and supervision for the proper retrofitting of buildings.

Recent Advances in Earthquake Engineering in Europe Kyriazis Pitilakis 2018-04-24 This book is a collection of invited lectures including the 5th Nicholas Ambraseys distinguished lecture, four keynote lectures and

twenty-two thematic lectures presented at the 16th European Conference on Earthquake Engineering, held in Thessaloniki, Greece, in June 2018. The lectures are put into chapters written by the most prominent internationally recognized academics, scientists, engineers and researchers in Europe. They address a comprehensive collection of state-of-the-art and cutting-edge topics in earthquake engineering, engineering seismology and seismic risk assessment and management. The book is of interest to civil engineers, engineering seismologists, seismic risk managers, policymakers and consulting companies covering a wide spectrum of fields from geotechnical and structural earthquake engineering, to engineering seismology and seismic risk assessment and management. Scientists, professional engineers, researchers, civil protection policymakers and students interested in the seismic design of civil engineering structures and infrastructures, hazard and risk assessment, seismic mitigation policies and strategies, will find in this book not only the most recent advances in the state-of-the-art, but also new ideas on future earthquake engineering and resilient design of structures. Chapter 1 of this book is available open access under a CC BY 4.0 license.

Advanced Polymer Composites for Structural Applications in Construction L C Hollaway 2004-04-22 Following the success of ACIC 2002, this is the 2nd International Conference focusing on the application and further exploitation of advanced composites in construction held at the University of Surrey in April 2004. With over 100 delegates the conference brought together practicing engineers, asset managers, researchers and representatives of regulatory bodies to promote the active exchange of scientific and technical information on the rapidly changing scene of advanced composites in construction. The aim of the conference was to encourage the presentation of new concepts, techniques and case studies, which will lead to greater exploitation of advanced polymer composites and FRP materials for the civil engineering infrastructure, rehabilitation and renewal.

3rd fib Congress Washington USA FIB – International Federation for Structural Concrete 2010-06-01

Composite Materials Charles E. Bakis 2003 "The 14th ASTM Symposium on Composite Materials: Testing and Design, was held March 11-12, 2002 in Pittsburgh, PA. The Testing and Design symposia, sponsored by Committee D30 on Composite Materials, have been scheduled on a roughly bi-yearly basis since 1969 to provide a forum for researchers and practitioners to meet and exchange their latest methods and findings related to the testing and design of composite materials and structures."

Retrofitting of Concrete Structures by Externally Bonded FRPs, With Emphasis on Seismic Applications fib Fédération internationale du béton 2006-01-01 fib Bulletin 35 is the first bulletin to publish documentation from an fib short course. These courses are held worldwide and cover advanced knowledge of structural concrete in general, or specific topics. They are organized by fib and given by internationally recognized experts in fib, often supplemented with local experts active in fib. They are based on the knowledge and expertise from fib's ten Commissions and nearly fifty Task Groups. fib Bulletin 35 presents the course materials developed for the short course "Retrofitting of Concrete Structures through Externally Bonded FRP, with emphasis on Seismic Applications", given in Ankara and Istanbul in June 2005. The course drew on expertise both from outside Turkey and from the large pool of local experts on this subject. In most countries of the

world, the building stock is ageing and needs continuous maintenance or repair. Moreover, the majority of existing constructions are deficient in the light of current knowledge and design codes. The problem of structural deficiency of existing constructions is especially acute in seismic regions, as, even there, seismic design of structures is relatively recent. The direct and indirect costs of demolition and reconstruction of structurally deficient constructions are often prohibitive; furthermore they entail a substantial waste of natural resources and energy. Therefore, structural retrofitting is becoming increasingly widespread throughout the world. Externally bonded Fibre Reinforced Polymers (FRPs) are rapidly becoming the technique of choice for structural retrofitting. They are cleaner and easier to apply than conventional retrofitting techniques, reduce disruption to the occupancy and operation of the facility, do not generate debris or waste, and reduce health and accident hazards at the construction site as well as noise and air pollution in the surroundings. fib Bulletin 35 gives state-of-the-art coverage of retrofitting through FRPs and presents relevant provisions from three recent standardisation milestones: EN 1998-3:2005 "Eurocode 8: Design of structures for earthquake resistance - Part 3: Assessment and retrofitting of buildings", the 2005 Draft of the Turkish seismic design code, and the Italian regulatory document CNR-DT 200/04, "Instructions for Design, Execution and Control of Strengthening Interventions by Means of Fibre-Reinforced Composites" (2004).

Polymers in Construction Güneri Akovalı 2005 This book is a good basic guide to the polymers that are used in the construction industry. The types of polymers that can be used are discussed and specific applications are also covered. There is also a very comprehensive section on the health and safety aspects of using polymers in buildings.