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CFE - HILLARY DEVAN

The first textbook on the design of FRP for structural engineering applications Composites for Construction is a one-of-a-kind guide to understanding fiber-reinforced polymers (FRP) and designing and retrofitting structures with FRP. Written and organized like traditional textbooks on steel, concrete, and wood design, it demystifies FRP composites and demonstrates how both new and retrofit construction projects can especially benefit from these materials, such as offshore and waterfront structures, bridges, parking garages, cooling towers, and industrial buildings. The code-based design guidelines featured in this book allow for demonstrated applications to immediately be implemented in the real world. Covered codes and design guidelines include ACI 440, ASCE Structural Plastics Design Manual, EUROCOMP Design Code, AASHTO Specifications, and manufacturer-published design guides. Procedures are provided to the structural designer on how to use this combination of code-like documents to design with FRP profiles. In four convenient sections, Composites for Construction covers: * An introduction to FRP applications, products and properties, and to the methods of obtaining the characteristic properties of FRP materials for use in structural design * The design of concrete structural members reinforced with FRP reinforcing bars * Design of FRP strengthening systems such as strips, sheets, and fabrics for upgrading the strength and ductility of reinforced concrete structural members * The design of trusses and frames made entirely of FRP structural profiles produced by the pultrusion process

This text presents the theoretical and practical aspects of analysis and design, complemented by numerous design examples.

Written for the practicing architect, Structural Design addresses the process on both a conceptual and a mathematical level. Most importantly, it helps architects work with structural consultants and understand all the necessary considerations when designing structural systems. Using a minimum of simple math, this book shows you how to make correct design calculations for structures made from steel, wood, concrete, and masonry. What's more, this edition has been completely updated to reflect the latest design methods and codes, including LRFD for steel design. The book was also re-designed for easy navigation. Essential principles, as well as structural solutions, are visually reinforced with hundreds of drawings, photographs, and other illustrations--making this book truly architect-friendly.

High strength fibre composites (FRPs) have been used with civil structures since the 1980s, mostly in the repair, strengthening and retrofitting of concrete structures. This has attracted considerable research, and the industry has expanded exponentially in the last decade. Design guidelines have been developed by professional organizations in a number of countries including USA, Japan, Europe and China, but until now designers have had no publication which provides practical guidance or accessible coverage of the fundamentals. This book fills this void. It deals with the fundamentals of composites, and basic design principles, and provides step-by-step guidelines for design. Its main theme is the repair and retrofit of un-reinforced, reinforced and prestressed concrete structures using carbon, glass and other high strength fibre composites. In the case of beams, the focus is on their strengthening for flexure and shear or their stiffening. The main interest with columns is the improvement of their ductility; and both strengthening and ductility improvement of un-reinforced structures are covered. Methods for evaluating the strengthened structures are presented. Step by step procedures are set out, including flow charts, for the various structural components, and design examples and practice problems are used to illustrate. As infrastructure ages worldwide, and its demolition and replacement becomes less of an option, the need for repair and retrofit of existing facilities will increase. Besides its audience of design professionals, this book suits graduate and advanced undergraduate students.

Design of Reinforced Concrete, 10th Edition by Jack McCormac and Russell Brown, introduces the fundamentals of reinforced concrete design in a clear and comprehensive manner and grounded in the basic principles of mechanics of solids. Students build on their understanding of basic mechan-

ics to learn new concepts such as compressive stress and strain in concrete, while applying current ACI Code.

Completely revised to reflect the new ACI 318-08 Building Code and International Building Code, IBC 2009, this popular book offers a unique approach to examining the design of prestressed concrete members in a logical, step-by-step trial and adjustment procedure. Integrates handy flow charts to help readers better understand the steps needed for design and analysis. Includes a revised chapter containing the latest ACI and AASHTO Provisions on the design of post-tensioned beam end anchorage blocks using the strut-and-tie approach in conformity with ACI 318-08 Code. Offers a new complete section with two extensive design examples using the strut-and-tie approach for the design of corbels and deep beams. Features an addition to the elastic method of design, with comprehensive design examples on LRFD and Standard AASHTO designs of bridge deck members for flexure, shear and torsion, conforming to the latest AASHTO specifications. Includes a revised chapter on slender columns, including a simplified load-contour biaxial bending method which is easier to apply in design, using moments rather than loads in the reciprocal approach. A useful construction reference for engineers.

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.

Now reflecting the new 2008 ACI 318-08 Code and the new International Building Code (IBC-2006), this cutting-edge text has been extensively revised to present state-of-the-art developments in reinforced concrete. The text analyzes the design of reinforced concrete members through a unique and practical step-by-step trial and adjustment procedure. It is supplemented with flowcharts that guide readers logically through key features and underlying theory. Hundreds of photos of tests to failure of concrete elements help readers visualize this behavior. Ideal for practicing engineers who need to contend with the new revisions of the ACI, IBC, and AASHTO Codes.

Reliability of Structures enables both students and practising engineers to appreciate how to value and handle reliability as an important dimension of structural design. It discusses the concepts of limit states and limit state functions, and presents methodologies for calculating reliability indices and calibrating partial safety factors. It also supplies information on the probability distributions and parameters used to characterize both applied loads and member resistances. This revised and extended second edition contains more discussions of US and international codes and the issues underlying their development. There is significant revision and expansion of the discussion on Monte Carlo simulation, along with more examples. The book serves as a textbook for a one-semester course for advanced undergraduates or graduate students, or as a reference and guide to consulting structural engineers. Its emphasis is on the practical applications of structural reliability theory rather than the theory itself. Consequently, probability theory is treated as a tool, and enough is given to show the novice reader how to calculate reliability. Some background in structural engineering and structural mechanics is assumed. A solutions manual is available upon qualifying course adoption.

Get the updated industry standard for a new age of construction! For more than fifty years, Olin's Construction has been the cornerstone reference in the field for architecture and construction professionals and students. This new edition is an invaluable resource that will provide in-depth coverage for decades to come. You'll find the most up-to-date principles, materials, methods, codes, and standards used in the design and construction of contemporary concrete, steel, masonry, and

wood buildings for residential, commercial, and institutional use. Organized by the principles of the MasterFormat® 2010 Update, this edition: Covers sitework; concrete, steel, masonry, wood, and plastic materials; sound control; mechanical and electrical systems; doors and windows; finishes; industry standards; codes; barrier-free design; and much more Offers extensive coverage of the metric system of measurement Includes more than 1,800 illustrations, 175 new to this edition and more than 200 others, revised to bring them up to date Provides vital descriptive information on how to design buildings, detail components, specify materials and products, and avoid common pitfalls Contains new information on sustainability, expanded coverage of the principles of construction management and the place of construction managers in the construction process, and construction of long span structures in concrete, steel, and wood The most comprehensive text on the subject, Olin's Construction covers not only the materials and methods of building construction, but also building systems and equipment, utilities, properties of materials, and current design and contracting requirements. Whether you're a builder, designer, contractor, or manager, join the readers who have relied on the principles of Olin's Construction for more than two generations to master construction operations.

Concrete is an integral part of twenty-first century structural engineering, and an understanding of how to analyze and design concrete structures is a vital part of training as a structural engineer. With Eurocode legislation increasingly replacing British Standards, it's also important to know how this affects the way you can work with concrete. Newly revised to Eurocode 2, this second edition retains the original's emphasis on qualitative understanding of the overall behaviour of concrete structures. Now expanded, with a new chapter dedicated to case studies, worked examples, and exercise examples, it is an even more comprehensive guide to conceptual design, analysis, and detailed design of concrete structures. The book provides civil and structural engineering students with complete coverage of the analysis and design of reinforced and prestressed concrete structures. Great emphasis is placed on developing a qualitative understanding of the overall behaviour of 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.

An indispensable resource for anyone wanting to create, maintain, improve, understand, or use the diverse information resources within a sci-tech library. • Over 80 screenshots of electronic information resource tools designed for the engineer and scientist; page reproductions from print sources and illustrations from scholarly journal articles and monographs are also included • Each chapter concludes with a comprehensive list of additional resources for further research • Approximately 30 discipline-specific subject bibliographies in the appendix section act as indispensable guides for developing library collections, as well as for compiling introductory textbooks appropriate for library science students • Included pathfinders provide expert guides for targeted online research • Corresponding instructor exercises are available at the publisher's website
Publisher Description

"In order to reduce the seismic risk facing many densely populated regions worldwide, including Canada and the United States, modern earthquake engineering should be more widely applied. But current literature on earthquake engineering may be difficult to grasp for structural engineers who are untrained in seismic design. In addition no single resource addressed seismic design practices in both Canada and the United States until now. Elements of Earthquake Engineering and Structural Dynamics was written to fill the gap. It presents the key elements of earthquake engineering and structural dynamics at an introductory level and gives readers the basic knowledge they need to apply the seismic provisions contained in Canadian and American building codes."--Résumé de

l'éditeur.

For more information including the introduction, a full list of entries and contributors, a generous selection of sample pages and more, visit the Encyclopedic of 20th Century Architecture website. Focusing on architecture from all regions of the world, this three-volume set profiles the twentieth century's vast chronicle of architectural achievements, both within and well beyond the theoretical confines of modernism. Unlike existing works, this encyclopedia examines the complexities of rapidly changing global conditions that have dispersed modern architectural types, movements, styles, and building practices across traditional geographic and cultural boundaries.

For one-semester, senior/graduate-level courses in Prestressed Concrete in the department of civil engineering. Completely revised to reflect the new ACI 318-02 Building Code and International Building Code 2000 and its 2002 modifications, this popular text offers a unique approach to examining the design of prestressed concrete members in a logical, step-by-step trial and adjustment procedure. Encouraging clear, systematic thinking, it integrates handy flow charts to better understand the steps needed for design and analysis. Extensive discussions on material properties and concrete performance are provided, as well as an in-depth analysis of prestressing of circular tanks for liquid and gas containment and their prestressed shell roofs. - NEW - Revised chapter on the design of post-tensioned beam end anchorage blocks - Using the strut-and-tie approach in addition to the elastic method of design, supplies students with comprehensive design examples on LRFD and Standard AASHTO designs of bridge deck members for flexure, shear, and torsion, conforming to the latest AASHTO 2002 specifications. - NEW - Detailed chapter on the design of statically indeterminate multi-span prestressed c

Fibre-reinforced polymer (FRP) reinforcement has been used in construction as either internal or external reinforcement for concrete structures in the past decade. This book provides the latest research findings related to the development, design and application of FRP reinforcement in new construction and rehabilitation works. The topics include FRP properties and bond behaviour, externally bonded reinforcement for flexure, shear and confinement, FRP structural shapes, durability, member behaviour under sustained loads, fatigue loads and blast loads, prestressed FRP tendons, structural strengthening applications, case studies, and codes and standards.

The third edition of Reinforced and Prestressed Concrete continues to be the most comprehensive text for engineering students, instructors and practising engineers. Theoretical and practical aspects of analysis and design are presented in a clear, easy-to-follow manner and are complemented by numerous illustrative and design examples to aid students' comprehension of complex concepts. This edition has been fully updated to reflect recent amendments and addenda to the Australian Standard for Concrete Structures AS3600-2009 and allied standards. Two new chapters, covering T-beams, irregular-shaped sections and continuous beams, and strut-and-tie modelling have been added as discrete modules to enhance the progression of topics. Additional information is provided on fire resistance, detailing and covering, long-term deflection and design for torsion. An expanded collection of end-of-chapter tutorial problems consolidate student learning and develop problem-solving skills. Reinforced and Prestressed Concrete remains an indispensable resource for students and engineers continuing their professional development.

The most up to date structural concrete text, with the latest ACI revisions Structural Concrete is the bestselling text on concrete structural design and analysis, providing the latest information and clear explanation in an easy to understand style. Newly updated to reflect the latest ACI 318-14 code, this sixth edition emphasizes a conceptual understanding of the subject, and builds the student's body of knowledge by presenting design methods alongside relevant standards and code. Numerous examples and practice problems help readers grasp the real-world application of the industry's best practices, with explanations and insight on the extensive ACI revision. Each chapter features examples using SI units and US-SI conversion factors, and SI unit design tables are included for reference. Exceptional weather-resistance and stability make concrete a preferred construction material for most parts of the world. For civil and structural engineering applications, rebar and steel beams are generally added during casting to provide additional support. Pre-cast concrete is becoming increasingly common, allowing better quality control, the use of special admixtures, and the production of innovative shapes that would be too complex to construct on site. This book provides complete guidance toward all aspects of reinforced concrete design, including the ACI revisions that address these new practices. Review the properties of reinforced concrete, with models for shrink and creep Understand shear, diagonal tension, axial loading, and torsion Learn planning considerations for reinforced beams and strut and tie Design retaining walls, footings, slender columns, stairs, and more The American Concrete Institute updates structural concrete

code approximately every three years, and it's critical that students learn the most recent standards and best practices. Structural Concrete provides the most up to date information, with intuitive explanation and detailed guidance.

High performance concrete is a key element in virtually all-large construction projects, from tall office and residential buildings to bridges, tunnels and roadways. The fully updated Second Edition helps professionals to understand the performance capabilities of these construction materials when selecting the type of concrete to use for particular projects. The author is one of the worlds acknowledged experts on high performance concrete.

Fully updated coverage of earthquake-resistant engineering techniques, regulations, and codes This thoroughly revised resource offers cost-effective earthquake engineering methods and practical instruction on underlying structural dynamics concepts. Earthquake Engineering, Third Edition, teaches how to analyze the behavior of structures under seismic excitation and features up-to-date details on the design and construction of earthquake-resistant steel and reinforced concrete buildings, bridges, and isolated systems. All applicable requirements are fully explained—including the 2015 International Building Code and the latest ACI, AISC, and AASHTO codes and regulations. Advanced chapters cover seismic isolation, synthetic earthquakes, foundation design, and geotechnical aspects such as liquefaction. Earthquake Engineering, Third Edition, covers: Characteristics of earthquakes Linear elastic dynamic analysis Nonlinear and inelastic dynamic analysis Behavior of structures under seismic excitation Design of earthquake-resistant buildings (IBC) Seismic provisions of reinforced concrete structures (ACI code) Introduction to seismic provisions of steel structures (AISC code) Design of earthquake-resistant bridges (AASHTO code) Geotechnical aspects and foundations Synthetic earthquakes Introduction to seismic isolation

Up-to-date coverage of bridge design and analysis revised to reflect the fifth edition of the AASHTO LRFD specifications Design of Highway Bridges, Third Edition offers detailed coverage of engineering basics for the design of short- and medium-span bridges. Revised to conform with the latest fifth edition of the American Association of State Highway and Transportation Officials (AASHTO) LRFD Bridge Design Specifications, it is an excellent engineering resource for both professionals and students. This updated edition has been reorganized throughout, spreading the material into twenty shorter, more focused chapters that make information even easier to find and navigate. It also features: Expanded coverage of computer modeling, calibration of service limit states, rigid method system analysis, and concrete shear Information on key bridge types, selection principles, and aesthetic issues Dozens of worked problems that allow techniques to be applied to real-world problems and design specifications A new color insert of bridge photographs, including examples of historical and aesthetic significance New coverage of the "green" aspects of recycled steel Selected references for further study From gaining a quick familiarity with the AASHTO LRFD specifications to seeking broader guidance on highway bridge design Design of Highway Bridges is the one-stop, ready reference that puts information at your fingertips, while also serving as an excellent study guide and reference for the U.S. Professional Engineering Examination.

Illustrates the Global Relevance of SustainabilityApplicable 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

The purpose of this text is to provide a straightforward introduction to the principles and methods of design for concrete structures. The theory and practice described are of fundamental nature and will be of use internationally.

The book combines history with academic notes for use at the university level, presenting design examples from actual jobs with applications and detailing for the practicing engineer. Chapter 1 tells the history of post-tensioned concrete as only Ken Bondy can tell it. Chapters 2-8 are the notes Dirk Bondy uses to teach Design of Prestressed Concrete Structures at UCLA and Cal Poly-San Luis Obispo. Chapters 9-13 are design examples that address many of the decisions faced by practicing engineers on typical projects. Chapters 13-14 cover the art of detailing and observing the construction of post-tensioned concrete. This knowledge was obtained over many years of working on our own projects and listening and learning from the the pioneers of post-tensioned concrete. Chapter 15 covers the slab on grade industry, which represents more sales of post-tensioning tendons than all other post-tensioning applications combined. Chapter 16 discusses the challenging application of post-tensioning-external post-tensioning.

The first edition of this comprehensive work quickly filled the need for an in-depth handbook on

concrete construction engineering and technology. Living up to the standard set by its bestselling predecessor, this second edition of the Concrete Construction Engineering Handbook covers the entire range of issues pertaining to the construction

This is the eBook of the printed book and may not include any media, website access codes, or print supplements that may come packaged with the bound book. Civil Drafting Technology Seventh Edition covers it all—basic and advanced topics—and everything in between, equipping readers to convert engineering sketches or instructions into actual formal drawings and gain a working knowledge of mapping. Using a “knowledge building” format where one concept is mastered before the next is introduced, Civil Drafting Technology includes: Basic Drafting Topics Maps: fundamentals, types of maps, scales, symbols CADD: use, standards, applications Intermediate/Advanced Topics Measuring distance and elevation, Surveying, Location & Direction, Legal Descriptions and Plot Plans, Contour Lines, Horizontal Alignment Layout, GIS Career Development Schooling, Employment, Workplace Ethics, Professional Organizations CADD Applications Content-related Tests Real-world drafting and design problems

The use of COSMOS for the analysis and solution of structural dynamics problems is introduced in this new edition. The COSMOS program was selected from among the various professional programs available because it has the capability of solving complex problems in structures, as well as in other engineering fields such as Heat Transfer, Fluid Flow, and Electromagnetic Phenomena. COSMOS includes routines for Structural Analysis, Static, or Dynamics with linear or nonlinear behavior (material nonlinearity or large displacements), and can be used most efficiently in the micro-computer. The larger version of COSMOS has the capacity for the analysis of structures modeled up to 64,000 nodes. This fourth edition uses an introductory version that has a capability limited to 50 nodes or 50 elements. This version is included in the supplement, STRUCTURAL DYNAMICS USING COSMOS 1. The sets of educational programs in Structural Dynamics and Earthquake Engineering that accompanied the third edition have now been extended and updated. These sets include programs to determine the response in the time or frequency domain using the FFF (Fast Fourier Transform) of structures modeled as a single oscillator. Also included is a program to determine the response of an inelastic system with elastoplastic behavior and a program for the development of seismic response spectral charts. A set of seven computer programs is included for modeling structures as two-dimensional and three dimensional frames and trusses.

For courses in Civil Engineering Materials, Construction Materials, and Construction Methods and Materials offered in Civil, Environmental, or Construction engineering departments. This introduction gives students a basic understanding of the material selection process and the behavior of materials — a fundamental requirement for all civil and construction engineers performing design, construction, and maintenance. The authors cover the various materials used by civil and construction engineers in one useful reference, limiting the vast amount of information available to the introductory level, concentrating on current practices, and extracting information that is relevant to the general education of civil and construction engineers. A large number of experiments, figures, sample problems, test methods, and homework problems gives students opportunity for practice and review.

This highly successful textbook has been comprehensively revised for two main reasons: to bring the book up-to-date and make it compatible with BS8110 1985; and to take into account the increasing use made of microcomputers in civil engineering. An important chapter on microcomputer applications has been added.

This revised, fully updated second edition covers the analysis, design, and construction of reinforced concrete structures from a real-world perspective. It examines different reinforced concrete elements such as slabs, beams, columns, foundations, basement and retaining walls and prestressed concrete incorporating the most up-to-date edition of the American Concrete Institute Code (ACI 318-14) requirements for the design of concrete structures. It includes a chapter on metric system in reinforced concrete design and construction. A new chapter on the design of formworks has been added which is of great value to students in the construction engineering programs along with practicing engineers and architects. This second edition also includes a new appendix with color images illustrating various concrete construction practices, and well-designed buildings. The ACI 318-14 constitutes the most extensive reorganization of the code in the past 40 years. References to the various sections of the ACI 318-14 are provided throughout the book to facilitate its use by students and professionals. Aimed at architecture, building construction, and undergraduate engineering students, the scope of concepts in this volume emphasize simplified and practical methods in the analysis and design of reinforced concrete. This is distinct from advanced,

graduate engineering texts, where treatment of the subject centers around the theoretical and mathematical aspects of design. As in the first edition, this book adopts a step-by-step approach to solving analysis and design problems in reinforced concrete. Using a highly graphical and interactive approach in its use of detailed images and self-experimentation exercises, "Concrete Structures, Second Edition," is tailored to the most practical questions and fundamental concepts of design of structures in reinforced concrete. The text stands as an ideal learning resource for civil engineering, building construction, and architecture students as well as a valuable reference for concrete structural design professionals in practice.

Structural Cross Sections: Analysis and Design provides valuable information on this key subject covering almost all aspects including theoretical formulation, practical analysis and design computations, various considerations and issues related to cross-sectional behavior, and computer applications for determination of cross-sectional response. The presented approach can handle all complex shapes, material behaviors and configurations. The book starts with a clear and rigorous overview of role of cross-sections and their behavior in overall structural design process. Basic aspects of structural mechanics are reviewed and procedures to determine basic cross-sectional properties, stress and strain distributions, stress resultants and other response parameters, are provided.

A brief discussion about the role of material behavior in cross-sectional response is also included. The unified and integrated approach to determine axial-flexural capacity of cross-sections is utilized in development of P-M and M-M interaction diagrams of cross-sections of various shapes. The behavior and design of cross-sections subjected to shear and torsion is also included with emphasis on reinforced concrete sections. Several detailed flow charts are included to demonstrate the procedures used in ACI, BS and Euro codes for design of cross-section subjected to shear and torsion, followed by solved examples. The book also presents the discussion about various factors that can lead to ductile response of cross-sections, especially those made of reinforced concrete. The definition and development of action-deformation curves especially moment-curvature ($M-\phi$) curve is discussed extensively. Various factors such as confinement, rebar distribution and axial load effect on the ductility are shown through examples. The use of moment-curvature curve to compute various section response parameters is also explained through equations and examples. Several typical techniques and materials for retrofitting of cross-sections of reinforced concrete beams, columns and slabs etc. are reviewed. A brief discussion of various informative references related to the evaluation and retrofitting of structures is included for practical applications. Towards the end, the book provides an overview of various software applications available for cross-

section design and analysis. A framework for the development of a general-purpose cross-section analysis software, is presented and various features of few commercially available software packages are compared using some example cross-sections. Presents a generalized procedure to compute axial-flexural capacity of cross-sections of any number and configuration of materials Heavily illustrated with schematics, diagrams, and line drawings Includes the convenient approach to develop P-M interaction, M-M Interaction and Moment-Curvature relationships for reinforced concrete cross-sections Provides detailed flowcharts for code-based (ACI, BS and Eurocode) design of reinforced concrete cross-sections subjected to axial-flexural actions as well as shear-torsion. Presents formulae and expressions to compute various commonly used cross-sectional properties of common section shapes Discusses various parameters affecting the ductility of cross-sections and the role of confinement in the behavior reinforced concrete cross-sections Reviews various practical retrofitting techniques to rehabilitate the damaged cross-sections Covers the concepts discussed in main text using various solved and unsolved numerical examples Presents an overview of various computer applications and packages available for analysis of cross-sections Supported by author-developed computer-based apps to be used in conjunction with the practical applications presented in the book