

Etabs 2016 Version 16 1 0 Release Notes

As every civil engineer knows, Portland Cement is the most versatile and important material of construction, and will probably remain so far into the future. Yet few books, if any, exist that offer an in-depth analysis of the mixing and testing methods of this vital hydraulic cement. This statement, written about the first edition of Engineere

Standard ASCE/SEI 41-17 describes deficiency-based and systematic procedures that use performance-based principles to evaluate and retrofit existing buildings to withstand the effects of earthquakes.

This book presents select papers from the International Conference on Smart Materials and Techniques for Sustainable Development (SMTS) 2019. The contents focus on a wide range of methods and techniques related to sustainable development fields like smart structures and materials, innovation in water resource development, optical fiber communication, green construction materials, optimization and innovation in structural design, structural dynamics and earthquake engineering, structural health monitoring, nanomaterials, nanotechnology and sensors, smart biomaterials and medical devices, materials for energy conversion and storage devices, and IoT in sustainable development. This book aims to provide up-to-date and authoritative knowledge from both industrial and academic worlds, sharing best practice in the field of smart materials analysis. The contents of this book will be beneficial to students, researchers, and professionals working in the field of smart materials and sustainable development.

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 (-) 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

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.

The definitive guide to steel connection design—fully revised to cover the latest advances Featuring contributions from a team of industry-recognized experts, this up-to-date resource offers comprehensive coverage of every type of steel connection. The book explains leading methods for connecting structural steel components—including state-of-the-art techniques and materials—and contains new information on fastener and welded joints. Thoroughly updated to align with the latest AISC and ICC codes, Handbook of Structural Steel Connection Design and Details, Third Edition, features brand-new material on important structural engineering topics that are hard to find covered elsewhere. You will get complete details on fastener installation, space truss connections, composite member connections, seismic codes, and inspection and quality control requirements. The book also includes LRFD load guidelines and requirements from the American Welding Society. • Distills ICC and AISC 2016 standards and explains how they relate to steel connections • Features hundreds of detailed examples, photographs, and illustrations • Each chapter is written by a leading expert from industry or academia

Emphasizing a conceptual understanding of concrete design and analysis, this revised and updated edition builds the student's

understanding by presenting design methods in an easy to understand manner supported with the use of numerous examples and problems. Written in intuitive, easy-to-understand language, it includes SI unit examples in all chapters, equivalent conversion factors from US customary to SI throughout the book, and SI unit design tables. In addition, the coverage has been completely updated to reflect the latest ACI 318–11 code.

The principle of sustainability should be strictly connected with safety, since both aim to conserve resources: in the case of sustainability, the resources are typically thought of as environmental, while in the case of safety, the resources are basically human. In spite of this common ground, discussions on sustainability usually give insufficient attention to safety. In the last years the EU has made large investments to increase the energy efficiency of the existing building stock, paving the way for a low-carbon future; however, less effort has been made to enhance its seismic resilience. Therefore, the safety and, consequently, the sustainability of towns situated in earthquake-prone countries remain inadequate. In such countries, energy renovation actions should be combined with seismic retrofitting. However, a number of barriers considerably limit the real possibility of extensively undertaking combined retrofit actions, especially for multi-owner housing and high-rise buildings. These barriers are of different kinds: technical (e.g., unfeasibility and/or ineffectiveness of conventional retrofit solutions), financial (e.g., high renovation costs, insufficient incentives/subsidies), organizational (e.g., occupants' disruption and relocation, renovation consensus by condominium ownerships), and cultural/social (insufficient information and skills, lack of adequate policy measures for promoting renovation actions). This book aims to overcome these barriers and to bridge the gap between sustainability and safety, so to conserve both human and environmental resources.

Hard Guidance on Preventing Disproportionate Collapse Disproportionate collapse is a pressing issue in current design practice. Numerous causes are possible - especially forms of extreme loading, such as blast, fire, earthquake, or vehicle collisions. But it is the mechanism and its prevention which are of especial interest and concern. After the Wor

This book focuses on how to maintain environmental sustainability as one of its main principles, and it addresses how smart cities serve to diminish wastes and maintain natural resources by having clean green energy that is operated by new smart technology designs. Living in a smart city is not something of the future anymore, it is here, and it is being implemented all over the world. A smart city uses different types of electronic Internet of things (IoT) sensors to collect data and then use these data to manage assets and resources efficiently. The smart city concept integrates information and communication technology (ICT), and various physical devices connected to the IoT network to optimize the efficiency of city operations and services and achieve sustainable solutions to allow us to grow with proper management of our resources. Smart sustainable structures and infrastructures face the need of urban areas due to the growth of populations while in the same time save our environment. To achieve this, we need to revisit the conventional methods in design and construction and the conventional materials which are used now to optimize the design and provide smart solutions. In the past few years, the consumption of resources has been massive, and the waste produced from that consumption has been inconceivable. This is causing environmental degradation, which produces many environmental challenges, such as global climate change, excessive fossil fuel dependency and the growing demand for energy. As well as, discussing the challenges facing the civil engineering design and construction of smart cities components and presenting concepts and insight from experts and researchers from different civil engineering disciplines., this book explains how to construct buildings and special structures and how to manage and monitor energy.

This book presents a selection of the best papers from the HEaRT 2015 conference, held in Lisbon, Portugal, which provided a valuable forum for engineers and architects, researchers and educators to exchange views and findings concerning the technological history, construction features and seismic behavior of historical timber-framed walls in the Mediterranean countries. The topics covered are wide ranging and include historical aspects and examples of the use of timber-framed construction systems in response to earthquakes, such as the gaiola system in Portugal and the Bourbon system in southern Italy; interpretation of the response of timber-framed walls to seismic actions based on calculations and experimental tests; assessment of the effectiveness of repair and strengthening techniques, e.g., using aramid fiber wires or sheets; and modelling analyses. In addition, on the basis of case studies, a methodology is presented that is applicable to diagnosis, strengthening and improvement of seismic performance and is compatible with modern theoretical principles and conservation criteria. It is hoped that, by contributing to the knowledge of this construction technique, the book will help to promote conservation of this important component of Europe's architectural heritage.

Advances in Mechanical Engineering Select Proceedings of CAMSE 2020 Springer Nature Earthquakes and Structures Select Proceedings of 7th ICRA GEE 2021 Springer Nature Design and Construction of Smart Cities Toward Sustainable Community Springer Nature

Books on green building theories, principles and strategies applicable to life cycles of all kinds of buildings and building types are already widely available. However, those specifically on greening affordable housing that guide various housing stakeholders at different life cycles are still very limited. This book intends to fill this gap. Integrating green building enables stakeholders to address the environmental component that has not traditionally been seen as an integral part of affordable housing development. The book presents theories and principles with practical methods, strategies and processes not only to make affordable housing green but also to support economic stability and social equity.

Although the disciplines of architecture and structural engineering have both experienced their own historical development, their interaction has resulted in many fascinating and delightful structures. To take this interaction to a higher level, there is a need to stimulate the inventive and creative design of architectural structures and to persuade architects and structural engineers to further collaborate in this process, exploiting together new concepts, applications and challenges. This set of book of abstracts and full paper searchable CD-ROM presents selected papers presented at the 3rd International Conference on Structures and Architecture Conference (ICSA2016), organized by the School of Architecture of the University of Minho, Guimarães, Portugal (July 2016), to promote the synergy in the collaboration between the disciplines of architecture and structural engineering. The set addresses all major aspects of structures and architecture, including building envelopes, comprehension of complex forms, computer and experimental methods, concrete and masonry structures, educating architects and structural engineers, emerging technologies, glass structures, innovative architectural and structural design, lightweight and membrane structures, special structures, steel and composite structures, the borderline between architecture and structural engineering, the history of the relationship between architects and structural engineers, the tectonics of architectural solutions, the use of new materials, timber structures and more. The contributions on creative and scientific aspects of the conception and construction of structures, on

advanced technologies and on complex architectural and structural applications represent a fine blend of scientific, technical and practical novelties in both fields. This set is intended for both researchers and practitioners, including architects, structural and construction engineers, builders and building consultants, constructors, material suppliers and product manufacturers, and other experts and professionals involved in the design and realization of architectural, structural and infrastructural projects.

This volume contains the papers presented at IALCCE2016, the fifth International Symposium on Life-Cycle Civil Engineering (IALCCE2016), to be held in Delft, The Netherlands, October 16-19, 2016. It consists of a book of extended abstracts and a DVD with full papers including the Fazlur R. Khan lecture, keynote lectures, and technical papers from all over the world. All major aspects of life-cycle engineering are addressed, with special focus on structural damage processes, life-cycle design, inspection, monitoring, assessment, maintenance and rehabilitation, life-cycle cost of structures and infrastructures, life-cycle performance of special structures, and life-cycle oriented computational tools. The aim of the editors is to provide a valuable source for anyone interested in life-cycle of civil infrastructure systems, including students, researchers and practitioners from all areas of engineering and industry.

This volume of proceedings from the conference provides an opportunity for readers to engage with a selection of refereed papers that were presented during the 6th International Conference NUICONE'17. Researchers from industry and academia were invited to present their research work in the areas as listed below. The research papers presented in these tracks have been published in this proceeding with the support of CRC Press, Taylor & Francis Group. This proceeding will definitely provide a platform to proliferate new findings among the researchers. Chemical Process Development and Design Technologies for Green Environment Advances in Transportation Engineering Emerging Trends in Water Resources and Environmental Engineering Construction Technology and Management Concrete and Structural Engineering Sustainable Manufacturing Processes Design and Analysis of Machine and Mechanism Energy Conservation and Management The 2016 International Conference on Civil, Architecture and Environmental Engineering (ICCAE 2016), November 4-6, 2016, Taipei, Taiwan, is organized by China University of Technology and Taiwan Society of Construction Engineers, aimed to bring together professors, researchers, scholars and industrial pioneers from all over the world. ICCAE 2016 is the premier forum for the presentation and exchange of experience, progress and research results in the field of theoretical and industrial experience. The conference consists of contributions promoting the exchange of ideas between researchers and educators all over the world.

Excise taxes on tobacco and alcohol products can be an effective instrument for promoting public health through the curbing of smoking and excessive drinking, while raising significant financing for development priorities. Designed and implement well, excise taxes represent a win-win for public health and finances. While the public policy rationale for excise reforms is strong in both developed and developing countries, realizing reforms in practice often faces significant opposition by the industry and vested interests. Low level, complex and poorly designed excise tax regimes persist. Getting the technical details right, and effectively managing the political economy of reforms, are vital to securing better excise tax outcomes. The Philippines passed in 2012, implemented, and has been results monitoring a successful tobacco and alcohol tax, dubbed Sin Tax. The reform not only greatly increased, simplified and improved the excise tax reform, but also earmarked the significant part of the large ensuring incremental revenues to helping finance Universal Health Care (UHC) for the bottom forty percent of the population. Sin Tax Reform in the Philippines summarizes both the technical and political economy aspects of tobacco and excise tax reforms. The study analyzes issues of rate structure and levels, implementation phasing, and equity impact analysis. The book is intended as a resource for audiences in both the Philippines and other countries wishing to promote successful excise tax reforms to towards between public sector governance, finances and health. For the Philippines, it highlights measures to ensure that the revenue and expenditure measures associated with the reform continue to be delivered, and can be deepened over time. The Philippines experience should prove encouraging and useful for reform champions in other countries advancing similar types of excise tax and development financing/expenditure earmarking for equitable development and public health.

This book presents the selected peer-reviewed proceedings of the International Conference on Recent Trends and Innovations in Civil Engineering (ICRTICE 2019). The volume focuses on latest research and advances in the field of civil engineering and materials science such as design and development of new environmental materials, performance testing and verification of smart materials, performance analysis and simulation of steel structures, design and performance optimization of concrete structures, and building materials analysis. The book also covers studies in geotechnical engineering, hydraulic engineering, road and bridge engineering, building services design, engineering management, water resource engineering and renewable energy. The contents of this book will be useful for students, researchers and professionals working in civil engineering.

Discover BIM: A better way to build better buildings Building Information Modeling (BIM) offers a novel approach to design, construction, and facility management in which a digital representation of the building product and process is used to facilitate the exchange and interoperability of information in digital format. BIM is beginning to change the way buildings look, the way they function, and the ways in which they are designed and built. The BIM Handbook, Third Edition provides an in-depth understanding of BIM technologies, the business and organizational issues associated with its implementation, and the profound advantages that effective use of BIM can provide to all members of a project team. Updates to this edition include: Information on the ways in which professionals should use BIM to gain maximum value New topics such as collaborative working, national and major construction clients, BIM standards and guides A discussion on how various professional roles have expanded through the widespread use and the new avenues of BIM practices and services A wealth of new case studies that clearly illustrate exactly how BIM is applied in a wide variety of conditions Painting a colorful and thorough picture of the state of the art in building information modeling, the BIM Handbook, Third Edition guides readers to successful implementations, helping them to avoid needless frustration and costs and take full advantage of this paradigm-shifting approach to construct better buildings that consume fewer materials and require less time, labor, and capital resources.

Publisher's Note: Products purchased from Third Party sellers are not guaranteed by the publisher for quality, authenticity, or access to any online entitlements included with the product. Concise, visual explanations of code provisions that apply to seismic loads This practical guide provides engineers with a visual overview of the code provisions pertinent to seismic loads. Seismic Loads: Time-Saving Methods Using the 2018 IBC and ASCE/SEI 7-16 contains simplified, step-by-step procedures that can be applied to determine seismic design criteria and requirements. Included are design aids, figures, flowcharts, and examples that clearly demonstrate each procedure. Companion online Excel spreadsheets can be used in practice to calculate loads accurately and efficiently. Contains step-by-step procedures for: Seismic ground motion values Site-specific ground motion Seismic design category Seismic design for building structures Equivalent lateral force procedure Vertical and horizontal distribution of seismic forces Story drift determination P-delta effects Diaphragms, chords, and collectors Seismic forces on walls and their anchorage Determining seismic forces using a simplified method Seismic design for nonstructural components Seismic forces on nonbuilding structures

Bridge Maintenance, Safety, Management, Life-Cycle Sustainability and Innovations contains lectures and papers presented at the Tenth International Conference on Bridge Maintenance, Safety and Management (IABMAS 2020), held in Sapporo, Hokkaido, Japan, April 11–15, 2021. This volume consists of a book of extended abstracts and a USB card containing the full papers of 571 contributions presented at IABMAS 2020, including the T.Y. Lin Lecture, 9 Keynote Lectures, and 561 technical papers from 40 countries. The contributions presented at IABMAS 2020 deal with the state of the art as well as emerging concepts and innovative applications related to the main aspects of maintenance, safety, management, life-cycle sustainability and technological innovations of bridges. Major topics include: advanced bridge

design, construction and maintenance approaches, safety, reliability and risk evaluation, life-cycle management, life-cycle sustainability, standardization, analytical models, bridge management systems, service life prediction, maintenance and management strategies, structural health monitoring, non-destructive testing and field testing, safety, resilience, robustness and redundancy, durability enhancement, repair and rehabilitation, fatigue and corrosion, extreme loads, and application of information and computer technology and artificial intelligence for bridges, among others. This volume provides both an up-to-date overview of the field of bridge engineering and significant contributions to the process of making more rational decisions on maintenance, safety, management, life-cycle sustainability and technological innovations of bridges for the purpose of enhancing the welfare of society. The Editors hope that these Proceedings will serve as a valuable reference to all concerned with bridge structure and infrastructure systems, including engineers, researchers, academics and students from all areas of bridge engineering.

Focusing on the fundamentals of structural dynamics required for earthquake blast resistant design, Structural Dynamics in Earthquake and Blast Resistant Design initiates a new approach of blending a little theory with a little practical design in order to bridge this unfriendly gap, thus making the book more structural engineer-friendly. This is attempted by introducing the equations of motion followed by free and forced vibrations of SDF and MDF systems, D'Alembert's principle, Duhammel's integral, relevant impulse, pulse and sinusoidal inputs, and, most importantly, support motion and triangular pulse input required in earthquake and blast resistant designs, respectively. Responses of multistorey buildings subjected to earthquake ground motion by a well-known mode superposition technique are explained. Examples of real-size structures as they are being designed and constructed using the popular ETABS and STAAD are shown. Problems encountered in such designs while following the relevant codes of practice like IS 1893 2016 due to architectural constraints are highlighted. A very difficult constraint is in avoiding torsional modes in fundamental and first three modes, the inability to get enough mass participation, and several others. In blast resistant design the constraint is to model the blast effects on basement storeys (below ground level). The problem is in obtaining the attenuation due to the soil. Examples of inelastic hysteretic systems where top soft storey plays an important role in expending the input energy, provided it is not below a stiffer storey (as also required by IS 1893 2016), and inelastic torsional response of structures asymmetric in plan are illustrated in great detail. In both cases the concept of ductility is explained in detail. Results of response spectrum analyses of tall buildings asymmetric in plan constructed in Bengaluru using ETABS are mentioned. Application of capacity spectrum is explained and illustrated using ETABS for a tall building. Research output of retrofitting techniques is mentioned. Response spectrum analysis using PYTHON is illustrated with the hope that it could be a less expensive approach as it is an open source code. A new approach of creating a fictitious (imaginary) boundary to obtain blast loads on below-ground structures devised by the author is presented with an example. Aimed at senior undergraduates and graduates in civil engineering, earthquake engineering and structural engineering, this book: Explains in a simple manner the fundamentals of structural dynamics pertaining to earthquake and blast resistant design Illustrates seismic resistant designs such as ductile design philosophy and limit state design with the use of capacity spectrum Discusses frequency domain analysis and Laplace transform approach in detail Explains solutions of building frames using software like ETABS and STAAD Covers numerical simulation using a well-known open source tool PYTHON

Over the past two decades concrete has enjoyed a renewed level of research and testing, resulting in the development of many new types of concrete. Through the use of various additives, production techniques and chemical processes, there is now a great degree of control over the properties of specific concretes for a wide range of applications. New theories, models and testing techniques have also been developed to push the envelope of concrete as a building material. There is no current textbook which brings all of these advancements together in a single volume. This book aims to bridge the gap between the traditional concrete technologies and the emerging state-of-the-art technologies which are gaining wider use.

Offers the latest regulations on designing and installing commercial and residential buildings.

Intended primarily for teaching dynamics of structures to advanced undergraduates and graduate students in civil engineering departments, this text is the solutions manual to Dynamics of Structures, 2nd edition, which should provide an effective reference for researchers and practising engineers. The main text aims to present state-of-the-art methods for assessing the seismic performance of structure/foundation systems and includes information on earthquake engineering, taken from case examples.

A comprehensive guide to modern-day methods for earthquake engineering of concrete dams Earthquake analysis and design of concrete dams has progressed from static force methods based on seismic coefficients to modern procedures that are based on the dynamics of dam–water–foundation systems. Earthquake Engineering for Concrete Dams offers a comprehensive, integrated view of this progress over the last fifty years. The book offers an understanding of the limitations of the various methods of dynamic analysis used in practice and develops modern methods that overcome these limitations. This important book: Develops procedures for dynamic analysis of two-dimensional and three-dimensional models of concrete dams Identifies system parameters that influence their response Demonstrates the effects of dam–water–foundation interaction on earthquake response Identifies factors that must be included in earthquake analysis of concrete dams Examines design earthquakes as defined by various regulatory bodies and organizations Presents modern methods for establishing design spectra and selecting ground motions Illustrates application of dynamic analysis procedures to the design of new dams and safety evaluation of existing dams. Written for graduate students, researchers, and professional engineers, Earthquake Engineering for Concrete Dams offers a comprehensive view of the current procedures and methods for seismic analysis, design, and safety evaluation of concrete dams.

Written in a concise, easy-to-understand manner, INTRODUCTION TO GEOTECHNICAL ENGINEERING, 2e, presents intensive research and observation in the field and lab that have improved the science of foundation design. Now providing both U.S. and SI units, this non-calculus-based text is designed for courses in civil engineering technology programs where soil mechanics and foundation engineering are combined into one course. It is also a useful reference tool for civil engineering practitioners. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

Solid design and craftsmanship are a necessity for structures and infrastructures that must stand up to natural disasters on a regular basis. Continuous research developments in the engineering field are imperative for sustaining buildings against the threat of earthquakes and other natural disasters. Performance-Based Seismic Design of Concrete Structures and Infrastructures is an informative reference source on all the latest trends and emerging data associated with structural design. Highlighting key topics such as seismic assessments, shear wall structures, and infrastructure resilience, this is an ideal resource for all academicians, students, professionals, and researchers that are seeking new knowledge on the best methods and techniques for designing solid structural designs.

Modern Trends in Research on Steel, Aluminium and Composite Structures includes papers presented at the 14th International Conference on Metal Structures 2021 (ICMS 2021, Poznań, Poland, 16-18 June 2021). The 14th ICMS summarised a few years' theoretical, numerical and experimental research on steel, aluminium and composite structures, and presented new concepts. This book contains six plenary lectures and all the individual papers presented during the Conference. Seven plenary lectures were presented at the Conference, including "Research developments on glass structures under extreme loads", Parhp3D – The parallel MPI/openMPI implementation of the 3D hp-adaptive FE code", "Design of beam-to-column steel-concrete composite joints:

from Eurocodes and beyond", "Stainless steel structures – research, codification and practice", "Testing, modelling and design of bolted joints – effect of size, structural properties, integrity and robustness", "Design of hybrid beam-to-column joints between RHS tubular columns and I-section beams" and "Selected aspects of designing the cold-formed steel structures". The individual contributions delivered by authors covered a wide variety of topics: – Advanced analysis and direct methods of design, – Cold-formed elements and structures, – Composite structures, – Engineering structures, – Joints and connections, – Structural stability and integrity, – Structural steel, metallurgy, durability and behaviour in fire. Modern Trends in Research on Steel, Aluminium and Composite Structures is a useful reference source for academic researchers, graduate students as well as designers and fabricators.

Third Printing, incorporating errata, Supplement 1, and expanded commentary, 2013.

Concrete structures must be designed both to be safe against failure and to perform satisfactorily in use. This book is written for practising engineers, students and designers and concentrates on design methods for checking the main serviceability requirements of control of deflections and cracking in reinforced and prestressed concrete structures.

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