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Seismic Design of Steel Structures Victor Gioncu 2013-11-20 Providing real world applications for different structural types and seismic characteristics, Seismic Design of Steel Structures combines knowledge of seismic behavior of steel structures with the principles of earthquake engineering. This book focuses on seismic design, and concentrates specifically on seismic-resistant steel structures. Drawing o **NEHRP Recommended Provisions for the Development of Seismic Regulations for New Buildings: Commentary** Building Seismic Safety Council (U.S.) 1991

Design of Steel Structures Luis Simões da Silva 2012-01-09 This book introduces the fundamental design concept of Eurocode 3 for current steel structures in building construction, and their practical application. Following a discussion of the basis of design, including the principles of reliability management and the limit state approach, the material standards and their use are detailed. The fundamentals of structural analysis and modeling are presented, followed by the design criteria and approaches for various types of structural members. The theoretical basis and checking procedures are closely tied to the Eurocode requirements. The following chapters expand on the principles and applications of elastic and plastic design, each exemplified by the step-by-step design calculation of a braced steel-framed building and an industrial building, respectively. Besides providing the necessary theoretical concepts for a good understanding, this manual intends to be a supporting tool for the use of practicing engineers. In order of this purpose, throughout the book, numerous worked examples are provided, concerning the analysis of steel structures and the design of elements under several types of actions. These examples will facilitate the acceptance of the code and provide for a smooth transition from earlier national codes to the Eurocode.

NEHRP Recommended Provisions (National Earthquake Hazards Reduction Program) for Seismic Regulations for New Buildings and Other Structures: Commentary United States. Federal Emergency Management Agency 2001

NEHRP Recommended Provisions (National Earthquake Hazards Reduction Program) for Seismic Regulations for New Buildings and Other Structures: Provisions 1998

Unified Design of Steel Structures Louis F. Geschwindner 2011-12-20 Geschwindner's 2nd edition of Unified Design of Steel Structures provides an understanding that structural analysis and design are two integrated processes as well as the necessary skills and knowledge in investigating, designing, and detailing steel structures utilizing the latest design methods according to the AISC Code.The goal is to prepare readers to work in design offices as designers and in the field as inspectors. This new edition is compatible with the 2011 AISC code as well as marginal references to the AISC manual for design examples and illustrations, which was seen as a real advantage by the survey respondents. Furthermore, new sections have been added on: Direct Analysis, Torsional and flexural-torsional buckling of columns, Filled HSS columns, and Composite column interaction. More real-world examples are included in addition to new use of three-dimensional illustrations in the book and in the image gallery; an increased number of homework problems; and media approach Solutions Manual, Image Gallery. *Seismic Design of Building Structures* Michael R. Lindeburg 1994 - Solid review of seismic design exam topics- More than 100 practice problems- Includes step-by-step solutions Copyright © Libri GmbH. All rights reserved. STESSA 2000: Behaviour of Steel Structures in Seismic Areas Federico Mazzolani 2021-07-28 This is a review of developments in the behaviour and design of steel structures in seismic areas. The proceedings look at the analytical and experimental research on the seismic response of steel structures, and cover topics such as global behaviour and codification, design and application.

Seismic Resistant Steel Structures Federico M. Mazzolani 2014-05-04 The catastrophic earthquakes of the last decades (Mexico City, 1985; Loma Prieta, 1989; Northridge, 1994; Kobe, 1995) have seriously undermined there putation of steel structures, which in the past represented the most suitable solution for seismic resistant structures. Even if in very few cases, the performance of steel joints and members was unexpectedly bad, showing that it was due to some lacks in the current design concept. As a consequence of the lessons learned from the above dramatic events, many progress has been recently achieved in the conception, design and construction, by introducing the new deals of the performance based design, including the differentiation of earthquaketypes and considering all factor influencing the steel structure behaviour under strong ground motions. In this scenario, the aim of the book is to transfer the most recent achievements into practical rules for a safe design of seismic resistant steel structures. The seven Chapters cover the basic principles and design criteria for seismic resistant steel structures, which are applied to the main structural typologies, like moment resistant frames, braced frames and composite structures with particular reference to connections and details.

Textbook of Seismic Design G. R. Reddy 2019-08-03 This book focuses on the seismic design of Structures, Piping Systems and Components (SSC). It explains the basic mechanisms of earthquakes, generation of design basis ground motion, and fundamentals of structural dynamics; further, it delves into geotechnical aspects related to the earthquake design, analysis of multi degree-of-freedom systems, and seismic design of RC structures and steel structures. The book discusses the design of components and piping systems located at the ground level as well as at different floor levels of the structure. It also covers anchorage design of component and piping system, and provides an introduction to retrofitting, seismic response control including seismic base isolation, and testing of SSCs. The book is written in an easy-to-understand way, with review questions, case studies and detailed examples on each topic. This educational approach makes the book useful in both classrooms and professional training courses for students, researchers, and professionals alike.

Seismic Design of Reinforced Concrete Buildings Jack Moehle 2014-10-06 Complete coverage of earthquake-resistant concrete building design Written by a renowned seismic engineering expert, this authoritative resource discusses the theory and practice for the design and evaluation of earthquake-resisting reinforced concrete buildings. The book addresses the behavior of reinforced concrete materials, components, and systems subjected to routine and extreme loads, with an emphasis on response to earthquake loading. Design methods, both at a basic level as required by current building codes and at an advanced level needed for special problems such as seismic performance assessment, are described. Data and models useful for analyzing reinforced concrete structures as well as numerous illustrations, tables, and equations are included in this detailed reference. Seismic Design of Reinforced Concrete Buildings covers: Seismic design and performance verification Steel reinforcement Concrete Confined concrete Axially loaded members Moment and axial force Shear in beams, columns, and walls Development and anchorage Beam-column connections Slab-column and slab-wall connections Seismic design overview Special moment frames Special structural walls Gravity framing Diaphragms and collectors Foundations

Recommended Seismic Design Criteria for New Steel Moment-frame Buildings SAC Joint Venture. Guidelines Development Committee 2000

Ductile Design of Steel Structures, 2nd Edition Michel Bruneau 2011-07-14 Comprehensive coverage of the background and design requirements for plastic and seismic design of steel structures Thoroughly revised throughout, Ductile Design of Steel Structures, Second Edition, reflects the latest plastic and seismic design provisions and standards from the American Institute of Steel Construction (AISC) and the Canadian Standard Association (CSA). The book covers steel material, cross-section, component, and system response for applications in plastic and seismic design, and provides practical guidance on how to incorporate these principles into structural design. Three new chapters address buckling-restrained braced frame design, steel plate shear wall design, and hysteretic energy dissipating systems and design strategies. Eight other chapters have been extensively revised and expanded, including a chapter presenting the basic seismic design philosophy to determine seismic loads. Self-study problems at the end of each chapter help reinforce the concepts presented. Written by experts in earthquake-resistant design who are active in the development of seismic guidelines, this is an invaluable resource for students and professionals involved in earthquake engineering or other areas related to the analysis and design of steel structures. COVERAGE INCLUDES: Structural steel properties Plastic behavior at the cross-section level Concepts, methods, and applications of plastic analysis Building code seismic design philosophy Design of moment-resisting frames Design of concentrically braced frames Design of eccentrically braced frames Design of steel energy dissipating systems Stability and rotation capacity of steel beams Seismic Isolation, Structural Health Monitoring, and Performance Based Seismic Design in Earthquake Engineering Azer A. Kasimzade 2018-08-13 This book features chapters based on selected presentations from the International Congress on Advanced Earthquake Resistance of Structures, AERS2016, held in Samsun, Turkey, from 24 to 28 October 2016. It covers the latest advances in three widely popular research areas in Earthquake Engineering: Performance-Based Seismic Design, Seismic Isolation Systems, and Structural Health Monitoring. The book shows the vulnerability of high-rise and seismically isolated buildings to long periods of strong ground motions, and proposes new passive and semi-active structural seismic isolation systems to protect against such effects. These systems are validated through real-time hybrid tests on shaking tables. Structural health

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monitoring systems provide rapid assessment of structural safety after an earthquake and allow preventive measures to be taken, such as shutting down the elevators and gas lines, before damage occurs. Using the vibration data from instrumented tall buildings, the book demonstrates that large, distant earthquakes and surface waves, which are not accounted for in most attenuation equations, can cause long-duration shaking and damage in tall buildings. The overview of the current performance-based design methodologies includes discussions on the design of tall buildings and the reasons common prescriptive code provisions are not sufficient to address the requirements of tall-building design. In addition, the book explains the modelling and acceptance criteria associated with various performance-based design guidelines, and discusses issues such as selection and scaling of ground motion records, soil-foundation-structure interaction, and seismic instrumentation and peer review needs. The book is of interest to a wide range of professionals in earthquake engineering, including designers, researchers, and graduate students.

Seismic Design of Steel Structures Victor Gioncu 2013-11-20 Providing real world applications for different structural types and seismic characteristics, Seismic Design of Steel Structures combines knowledge of seismic behavior of steel structures with the principles of earthquake engineering. This book focuses on seismic design, and concentrates specifically on seismic-resistant steel structures. Drawing on experience from the Northridge to the Tohoku earthquakes, it combines understanding of the seismic behavior of steel structures with the principles of earthquake engineering. The book focuses on the global as well as local behavior of steel structures and their effective seismic-resistant design. It recognises different types of earthquakes, takes into account the especial danger of fire after earthquake, and proposes new bracing and connecting systems for new seismic resistant steel structures, and also for upgrading existing reinforced concrete structures. Includes the results of the extensive use of the DUCTROCT M computer program, which is used for the evaluation of the seismic available ductility, both monotonic and cyclic, for different types of earthquakes Demonstrates good design principles by highlighting the behavior of seismic-resistant steel structures in many applications from around the world Provides a methodological approach, making a clear distinction between strong and low-to-moderate seismic regions This book serves as a reference for structural engineers involved in seismic design, as well as researchers and graduate students of seismic structural analysis and design.

Earthquake Engineer 10th World 1992-01-01

Design of Steel Structures Elias G. Abu-Saba 2012-12-06 This book is intended for classroom teaching in architectural and civil engineering at the graduate and undergraduate levels. Although it has been developed from lecture notes given in structural steel design, it can be useful to practicing engineers. Many of the examples presented in this book are drawn from the field of design of structures. Design of Steel Structures can be used for one or two semesters of three hours each on the undergraduate level. For a two-semester curriculum, Chapters 1 through 8 can be used during the first semester. Heavy emphasis should be placed on Chapters 1 through 5, giving the student a brief exposure to the consideration of wind and earthquakes in the design of buildings. With the new federal requirements vis a vis wind and earthquake hazards, it is beneficial to the student to have some under standing of the underlying concepts in this field. In addition to the class lectures, the instructor should require the student to submit a term project that includes the complete structural design of a multi-story building using standard design procedures as specified by AISC Specifications. Thus, the use of the AISC Steel Construction Manual is a must in teaching this course. In the second semester, Chapters 9 through 13 should be covered. At the undergraduate level, Chapters 11 through 13 should be used on a limited basis, leaving the student more time to concentrate on composite construction and built-up girders.

Structural Steel Design Abi O. Aghayere 2009 This book is a comprehensive, stand alone reference for structural steel design. Giving the audience a thorough introduction to steel structures, this book contains all of the need to know information on practical design considerations in the design of steel buildings. It includes complete coverage of design methods, load combinations, gravity loads, lateral loads and systems in steel buildings, and much more.

Seismic Design Manual, 2nd Ed American Institute of Steel Construction 2012-09

Proceedings of the 10th International Conference on Behaviour of Steel Structures in Seismic Areas Federico M. Mazzolani 2022-05-07 This volume highlights the latest advances, innovations, and applications in the field of seismic design and performance of steel structures, as presented by leading international researchers and engineers at the 10th International Conference on the Behaviour of Steel Structures in Seismic Areas (STESSA), held in Timisoara, Romania, on 25-27 May 2022. It covers a diverse range of topics such as behaviour of structural members and connections, performance of structural systems, mixed and composite structures, energy dissipation systems, self-centring and low-damage systems, assessment and retrofitting, codes and standards, light-gauge systems. 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.

Elements of Earthquake Engineering and Structural Dynamics André Filiatrault 2013 "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.

Recent Trends in Cold-Formed Steel Construction Cheng Yu 2016-05-27 Recent Trends in Cold-Formed Steel Construction discusses advancements in an area that has become an important construction material for buildings. The book addresses cutting-edge new technologies and design methods using cold-formed steel as a main structural material, and provides technical guidance on how to design and build sustainable and energy-efficient cold-formed steel buildings. Part One of the book introduces the codes, specifications, and design methods for cold-formed steel structures, while Part Two provides computational analysis of cold-formed steel structures. Part Three examines the structural performance of cold-formed steel buildings and reviews the thermal performance, acoustic performance, fire protection, floor vibrations, and blast resistance of these buildings, with a final section reviewing innovation and sustainability in cold-formed steel construction. Addresses building sciences issues and provides performance solutions for cold-formed buildings Provides guidance for using the next generation design method, computational tools, and technologies Edited by an experienced researcher and educator with significant knowledge on new developments in cold-formed steel construction **Ductility of Seismic-Resistant Steel Structures** Victor Gioncu 2003-09-02 This book is a state-of-the-art report on the ductility of steel structures, containing a comprehensive review of the technical literature available, and presenting the results of the authors' own extensive research activities in this area. Analytical and numerical methods are described, and a wealth of practical information is provided. Ductility of Seismic-Resistant Steel Structures will be of great use to advanced students, researchers, designers and professionals in the field of civil, structural and earthquake engineering.

Behaviour of Steel Structures in Seismic Areas Federico Mazzolani 1995-10-12 This book forms the proceedings of the International Workshop organised by the European Convention for Constructional Steelwork held in Timisoara, Romania, in June 1994. It presents the latest progress in theoretical and experimental research on the behaviour of steel structures in seismic areas, taking into account the basic problems of local and global ductility, codification, design and applications. It relates strongly to the activities on international codification taking place in Europe.

Steel Structures Design for Lateral and Vertical Forces, Second Edition Alan Williams 2016-05-20 A Thoroughly Updated Guide to the Design of Steel Structures This comprehensive resource offers practical coverage of steel structures design and clearly explains the provisions of the 2015 International Building Code, the American Society of Civil Engineers ASCE 7-10, and the American Institute of Steel Construction AISC 360-10 and AISC 341-10. Steel Structures Design for Lateral and Vertical Forces, Second Edition, features start-to-finish engineering strategies that encompass the entire range of steel building materials, members, and loads. All techniques strictly conform to the latest codes and specifications. A brand new chapter on the design of steel structures for lateral loads explains design techniques and innovations in concentrically and eccentrically braced frames and moment frames. Throughout, design examples, including step-by-step solutions, and end-of-chapter problems using both ASD and LRFD methods demonstrate real-world applications and illustrate how code requirements apply to both lateral and vertical forces. This up-to-date Second Edition covers: · Steel Buildings and Design Criteria · Design Loads · Behavior of Steel Structures under Design Loads · Design of Steel Beams in Flexure · Design of Steel

Beams for Shear and Torsion · Design of Compression Members · Stability of Frames · Design by Inelastic Analysis · Design of Tension Members · Design of Bolted and Welded Connections · Plate Girders and Composite Members · Design of Steel Structures for Lateral Loads

Design of Steel Structures for Buildings in Seismic Areas ECCS - European Convention for Constructional Steelwork 2018-01-03 This volume elucidates the design criteria and principles for steel structures under seismic loads according to Eurocode 8-1. Worked Examples illustrate the application of the design rules. Two case studies serve as best-practice samples.

Design of Steel Structures for Buildings in Seismic Areas ECCS - European Convention for Constructional Steelwork 2018-05-25 This volume elucidates the design criteria and principles for steel structures under seismic loads according to Eurocode 8-1. Worked Examples illustrate the application of the design rules. Two case studies serve as best-practice samples.

Seismic Design of Buildings to Eurocode 8 Ahmed Elghazouli 2016-12-19 This book focuses on the seismic design of building structures and their foundations to Eurocode 8. It covers the principles of seismic design in a clear but brief manner and then links these concepts to the provisions of Eurocode 8. It addresses the fundamental concepts related to seismic hazard, ground motion models, basic dynamics, seismic analysis, siting considerations, structural layout, and design philosophies, then leads to the specifics of Eurocode 8. Code procedures are applied with the aid of walk-through design examples which, where possible, deal with a common case study in most chapters. As well as an update throughout, this second edition incorporates three new and topical chapters dedicated to specific seismic design aspects of timber buildings and masonry structures, as well as base-isolation and supplemental damping. There is renewed interest in the use of sustainable timber buildings, and masonry structures still represent a popular choice in many areas. Moreover, seismic isolation and supplemental damping can offer low-damage solutions which are being increasingly considered in practice. The book stems primarily from practical short courses on seismic design which have been run over a number of years and through the development Eurocode 8. The contributors to this book are either specialist academics with significant consulting experience in seismic design, or leading practitioners who are actively engaged in large projects in seismic areas. This experience has provided significant insight into important areas in which guidance is required.

Elementary Structural Analysis and Design of Buildings Dominick R. Pilla 2017-09-19 This overview of the analysis and design of buildings runs from basic principles and elementary structural analysis to the selection of structural systems and materials, and on to foundations and retaining structures. It presents a variety of approaches and methodologies while featuring realistic design examples. As a comprehensive guide and desk reference for practicing structural and civil engineers, and for engineering students, it draws on the author's teaching experience at The City College of New York and his work as a design engineer and architect. It is especially useful for those taking the National Council of Examiners for Engineering and Surveying SE exam.

Minimum Design Loads for Buildings and Other Structures American Society of Civil Engineers 2010 Minimum Design Loads for Buildings and Other Structures, ASCE/SEI 7-10, is a complete revision of ASCE Standard 7-05. ASCE 7-10 offers a complete update and reorganization of the wind load provisions, expanding them from one chapter into six to make them more understandable and easier to follow. ASCE 7-10 provides new ultimate event wind maps with corresponding reductions in load factors, so that the loads are not affected. It updates the seismic loads of ASCE 7-05, offering new risk-targeted seismic maps. The snow load, live load, and atmospheric icing provisions of ASCE 7-05 are all updated as well. ASCE Standard 7-10 provides requirements for general structural design and includes means for determining dead, live, soil, flood, wind, snow, rain, atmospheric ice, and earthquake loads, and their combinations that are suitable for inclusion in building codes and other documents. A detailed commentary containing explanatory and supplementary information to assist users of ASCE 7-10 is included with each chapter: ASCE 7-10 is an integral part of the building codes of the United States. Structural engineers, architects, and those engaged in preparing and administering local building codes will find the structural load requirements essential to their practice.

Seismic Design Methods for Steel Building Structures George A. Papagiannopoulos 2022-12-15 The book, after two introductory chapters on seismic design principles and structural seismic analysis methods, proceeds with the detailed description of seismic design methods for steel building structures. These methods include all the well-known methods, like force-based or displacement-based methods, plus some other methods developed by the present authors or other authors that have reached a level of maturity and are applicable to a large class of steel building structures. For every method, detailed practical examples and supporting references are provided in order to illustrate the methods and demonstrate their merits. As a unique feature, the present book describes not just one, as it is the case with existing books on seismic design of steel structures, but various seismic design methods including application examples worked in detail. The book is a valuable source of information, not only for MS and PhD students, but also for researchers and practicing engineers engaged with the design of steel building structures.

The Seismic Design Handbook Farzad Naeim 2012-12-06 This handbook contains up-to-date existing structures, computer applications, and information on planning, analysis, and design seismic design of wood structures. A new and very useful feature of this edition of earthquake-resistant building structures. Its intention is to provide engineers, architects, is the inclusion of a companion CD-ROM disc developers, and students of structural containing the complete digital version of the handbook itself and the following very engineering and architecture with authoritative, yet practical, design information. It represents important publications: an attempt to bridge the persisting gap between 1. UBC-IBC (1997-2000) Structural advances in the theories and concepts of Comparisons and Cross References, ICBO, earthquake-resistant design and their 2000. implementation in seismic design practice. 2. NEHRP Guidelines for the Seismic The distinguished panel of contributors is Rehabilitation of Buildings, FEMA-273, Federal Emergency Management Agency, composed of 22 experts from industry and universities, recognized for their knowledge and 1997. extensive practical experience in their fields. 3. NEHRP Commentary on the Guidelines for They have aimed to present clearly and the Seismic Rehabilitation of Buildings, FEMA-274, Federal Emergency concisely the basic principles and procedures pertinent to each subject and to illustrate with Management Agency, 1997. practical examples the application of these 4. NEHRP Recommended Provisions for principles and procedures in seismic design Seismic Regulations for New Buildings and practice. Where applicable, the provisions of Older Structures, Part 1 - Provisions, various seismic design standards such as mc FEMA-302, Federal Emergency 2000, UBC-97, FEMA-273/274 and ATC-40 Management Agency, 1997.

Structural Analysis and Design of Tall Buildings Bungale S. Taranath 2016-04-19 As software skills rise to the forefront of design concerns, the art of structural conceptualization is often minimized. Structural engineering, however, requires the marriage of artistic and intuitive designs with mathematical accuracy and detail. Computer analysis works to solidify and extend the creative idea or concept that might have started o

Structural Steel Design to Eurocode 3 and AISC Specifications Claudio Bernuzzi 2016-02-25 Structural Steel Design to Eurocode 3 and AISC Specifications deals with the theory and practical applications of structural steel design in Europe and the USA. The book covers appropriate theoretical and background information, followed by a more design-oriented coverage focusing on European and United States specifications and practices, allowing the reader to directly compare the approaches and results of both codes. Chapters follow a general plan, covering: • A general section covering the relevant topics for the chapter, based on classical theory and recent research developments • A detailed section covering design and detailing to Eurocode 3 specification • A detailed section covering design and detailing to AISC specifications Fully worked examples are using both codes are presented. With construction companies working in increasingly international environments, engineers are more and more likely to encounter both codes. Written for design engineers and students of civil and structural engineering, this book will help both groups to become conversant with both code systems.

STESSA 2003 - Behaviour of Steel Structures in Seismic Areas Federico Mazzolani 2018-03-29 Presenting a comprehensive overview of recent developments in the field of seismic resistant steel structures, this volume reports upon the latest progress in theoretical and experimental research into the area, and groups findings in the following key sections: • performance-based design of structures • structural integrity under exceptional loading • material and member behaviour • connections • global behaviour • moment resisting frames • passive and active control • strengthening and repairing • codification • design and application

European Seismic Design Practice - Research and Application A.S. Elnashai 2022-03-24 It is evident that European earthquake engineering research and design practice is assuming a role of increasing importance on the international scene. This is primarily due to two considerations; firstly the emergence of a core of European earthquake engineers who are co-operating on a long-term basis for the development of seismic design criteria specific to the European environment and secondly the identification of new problems in existing design practice in the USA and in Japan. It is in this context that European earthquake engineering activities and publications are eagerly observed and awaited by the international community. Includes a compact set of papers from leading research institutions, laboratories and companies in Europe, with a healthy number of contributions from elsewhere. It represents the European state-of-the-art and practice in earthquake testing, analysis & design of civil engineering works as well as strong-motion & hazard studies.

Structural Seismic Design Optimization and Earthquake Engineering: Formulations and Applications Plevris, Vagelis 2012-05-31 Throughout the past few years, there has been extensive research done on structural design in terms of optimization methods or problem formulation. But, much of this attention has been on the linear elastic structural behavior, under static loading condition. Such a focus has left researchers scratching their heads as it has led to vulnerable structural configurations. What researchers have left out of the equation is the element of seismic loading. It is essential for researchers to take this into account in order to develop earthquake resistant real-world structures. Structural Seismic Design Optimization and Earthquake Engineering: Formulations and Applications focuses on the research around earthquake engineering, in particular, the field of implementation of optimization algorithms in earthquake engineering problems. Topics discussed within this book include, but are not limited to, simulation issues for the accurate prediction of the seismic response of structures, design optimization procedures, soft computing applications, and other important advancements in seismic analysis and design where optimization algorithms can be implemented. Readers will discover that this book provides relevant theoretical frameworks in order to enhance their learning on earthquake engineering as it deals with the latest research findings and their practical implementations, as well as new formulations and solutions.

Tall Building Design Bungale S. Taranath 2016-10-04 Addresses the Question Frequently Proposed to the Designer by Architects: "Can We Do This? Offering guidance on how to use code-based procedures while at the same time providing an understanding of why provisions are necessary. Tall Building Design: Steel, Concrete, and Composite Systems methodically explores the structural behavior of steel, concrete, and composite members and systems. This text establishes the notion that design is a creative process, and not just an execution of framing proposals. It cultivates imaginative approaches by presenting examples specifically related to essential building codes and standards. Tying together precision and accuracy—it also bridges the gap between two design approaches—one based on initiative skill and the other based on computer skill. The book explains loads and load combinations typically used in building design, explores methods for determining design wind loads using the provisions of ASCE 7-10, and examines wind tunnel procedures. It defines conceptual seismic design, as the avoidance or minimization of problems created by the effects of seismic excitation. It introduces the concept of performance-based design (PBD). It also addresses serviceability considerations, prediction of tall building motions, damping devices, seismic isolation, blast-resistant design, and progressive collapse. The final chapters explain gravity and lateral systems for steel, concrete, and composite buildings. The Book Also Considers: Preliminary analysis and design techniques The structural rehabilitation of seismically vulnerable steel and concrete buildings Design differences between code-sponsored approaches The concept of ductility trade-off for strength Tall Building Design: Steel, Concrete, and Composite Systems is a structural design guide and reference for practicing engineers and educators, as well as recent graduates entering the structural engineering profession. This text examines all major concrete, steel, and composite building systems, and uses the most up-to-date building codes.

Earthquake-Resistant Structures Abbas Moustafa 2012-02-29 This book deals with earthquake-resistant structures, such as, buildings, bridges and liquid storage tanks. It contains twenty chapters covering several interesting research topics written by researchers and experts in the field of earthquake engineering. The book covers seismic-resistance design of masonry and reinforced concrete structures to be constructed as well as safety assessment, strengthening and rehabilitation of existing structures against earthquake loads. It also includes three chapters on electromagnetic sensing techniques for health assessment of structures, post earthquake assessment of steel buildings in fire environment and response of underground pipes to blast loads. The book provides the state-of-the-art on recent progress in earthquake-resistant structures. It should be useful to graduate students, researchers and practicing structural engineers.

Design of Steel Structures Jay Shen 2021-04-05 A straightforward overview of the fundamentals of steel structure design This hands-on structural engineering guide provides concise, easy-to-understand explanations of the design and behavior of steel columns, beams, members, and connections. Ideal for preparing you for the field, Design of Steel Structures includes real-world examples that demonstrate practical applications of AISC 360 specifications. You will get an introduction to more advanced topics, including connections, composite members, plate girders, and torsion. This textbook also includes access to companion online videos that help connect theory to practice. Coverage includes: Structural systems and elements Design considerations Tension members Design of columns AISC design requirements Design of beams Torsion Stress analysis and design considerations Beam-columns Connections Plate girders Intermediate transverse and bearing stiffeners