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Adaptive Pushover Analysis for the Seismic Assessment of Older Reinforced Concrete Buildings Modal Pushover Analysis for High-rise Buildings *Earthquake Engineering Frontiers in the New Millennium* Computational Structural Dynamics and Earthquake Engineering **Advanced Earthquake Engineering Analysis** Assessment of R. C. Flat Slab Building Seismic Design Methodologies for the Next Generation of Codes **Advanced Technologies, Systems, and Applications VII Seismic Assessment of RC Buildings Using Nonlinear Static Pushover Analysis** The 1940 Vrancea Earthquake. Issues, Insights and Lessons Learnt **Sustainability Trends and Challenges in Civil Engineering** *Performance-Based Seismic Engineering: Vision for an Earthquake Resilient Society* **Advances in Building Technology Computational Methods, Seismic Protection, Hybrid Testing and Resilience in Earthquake Engineering Modern Earthquake Engineering** Dynamics of Soil and Modelling of Geotechnical Problems Seismic Design of RC Buildings Computational Modelling of Concrete Structures *Safety, Reliability, Risk and Life-Cycle Performance of Structures and Infrastructures* Seismic Retrofit of Existing Reinforced Concrete Buildings *Understanding Structures and Earthquakes in Groningen Advances in Structural Engineering* **Dynamic Loading and Design of Structures Computational Structural Engineering** Seismic Assessment, Behavior and Retrofit of Heritage Buildings and Monuments **Trends in the Analysis and Design of Marine Structures Seismic Design Methods for Steel Building Structures** Seismic Design and Assessment of Bridges Assessment, Evaluation, and Repair of Concrete, Steel, and Offshore Structures *Earthquake Engineering in Europe* **STESSA 2003 - Behaviour of Steel Structures in Seismic Areas Evaluation of the Modal Pushover Analysis Procedure Using Vertically "regular" and Irregular Generic Frames** *Urban Habitat Constructions Under Catastrophic Events* **Advances in Earthquake Engineering for Urban Risk Reduction Computational Analysis and Design of Bridge Structures** *Proceedings of the Third National Seismic Conference and Workshop on Bridges and Highways* **Seismic Vulnerability of Structures Response of Structures Under Extreme Loading Proceedings of the 2nd International Symposium on Disaster Resilience and Sustainable Development Vulnérabilité sismique des constructions**

This book addresses applications of earthquake engineering for both offshore and land-based structures. It is self-contained as a reference work and covers a wide range of topics, including topics related to engineering seismology, geotechnical earthquake engineering, structural engineering, as well as special contents dedicated to design philosophy, determination of ground motions, shock waves, tsunamis, earthquake damage, seismic response of offshore and arctic structures, spatial varied ground motions, simplified and advanced seismic analysis methods, sudden subsidence of offshore platforms, tank liquid impacts during earthquakes, seismic resistance of non-structural elements, and various types of mitigation measures, etc. The target readership includes professionals in offshore and civil engineering, officials and regulators, as well as researchers and students in this field. This volume comprises papers presented at the China-US Millennium Symposium on Earthquake Engineering, held in Beijing, China, on November 8-11, 2000. This conference provides a forum for advancing the field of earthquake engineering through multi-lateral cooperation. The increasing necessity to solve complex problems in Structural Dynamics and Earthquake Engineering requires the development of new ideas, innovative methods and numerical tools for providing accurate numerical solutions in affordable computing times. This book presents the latest scientific developments in Computational Dynamics, Stochastic Dynam During the last

decade, the state-of-the-art in Earthquake Engineering Design and Analysis has made significant steps towards a more rational analysis of structures. This book reviews the fundamentals of displacement based methods. Starting from engineering seismology and earthquake geotechnical engineering, it proceeds to focus on design, analysis and testing of structures with emphasis on buildings and bridges. Doctoral Thesis / Dissertation from the year 2013 in the subject Engineering - Civil Engineering, grade: B, , course: Master of technology - Structural Dynamics, language: English, abstract: Flat-Slab building is very popular from the aesthetic and architectural point of view. From functional aspect a flat-slab building is more efficient than a R.C. frame building. So, construction of Flat-Slab building is increasing also in high seismic zone. Sometimes international building codes remain silent about the seismic response of flat slab buildings. In this paper the response of Flat-Slab building and a normal symmetric R.C. frame building of same dimension have been studied for varying seismic intensities. Static, Response Spectrum, Pushover, and Time history analysis have been performed to assess the performance of the two buildings. The costs of construction for these two buildings have also been compared. An extensive study on lumped plasticity model as per FEMA 356 with varying position of plastic hinge and its effect on pushover curve has also discussed in the paper. The paper also comments on the plastic hinge pattern. Seismic Retrofit of Existing Reinforced Concrete Buildings Understand the complexities and challenges of retrofitting building infrastructure Across the world, buildings are gradually becoming structurally unsound. Many were constructed before seismic load capacity was a mandatory component of building standards, and were often built with low-quality materials or using unsafe construction practices. Many more are simply aging, with materials degrading, and steel corroding. As a result, efforts are ongoing to retrofit existing structures, and to develop new techniques for assessing and enhancing seismic load capacity in order to create a safer building infrastructure worldwide. Seismic Retrofit of Existing Reinforced Concrete Buildings provides a thorough book-length discussion of these techniques and their applications. Balancing theory and practice, the book provides engineers with a broad base of knowledge from which to approach real-world seismic assessments and retrofitting projects. It incorporates knowledge and experience frequently omitted from the building design process for a fuller account of this critical engineering subfield. Seismic Retrofit of Existing Reinforced Concrete Buildings readers will also find: Detailed treatment of each available strengthening technique, complete with advantages and disadvantages In-depth guidelines to select a specific technique for a given building type and/or engineering scenario Step-by-step guidance through the assessment/retrofitting process Seismic Retrofit of Existing Reinforced Concrete Buildings is an ideal reference for civil and structural engineering professionals and advanced students, particularly those working in seismically active areas. These proceedings include most of the available information on this major seismic event and its consequences. With an estimated moment magnitude of 7.7 and a heavy toll in terms of human and economic losses, it ranks as the largest intermediate-depth earthquake in Europe in the twentieth century. Nevertheless, because of the difficult conditions in the 1940s, the lessons learnt after the Vrancea earthquake were not extensively shared with the international scientific community and thus, this book fills a gap in the literature discussing the knowledge acquired after major disasters. Past experience together with current understanding of the 1940 Vrancea earthquake are presented along with the latest information on Romanian seismicity, seismic hazard and risk assessment, and seismic evaluation and rehabilitation of buildings and structures. Moreover, it includes excerpts from Romanian post-disaster reports and textbooks concerning the earthquake. Civil engineers must assure that buildings have long and durable lives, and therefore structural assessment and repair are routinely required and must be performed with the utmost accuracy and professionalism. Assessment, Evaluation, and Repair of Concrete, Steel, and Offshore Structures presents the typical causes of structural failure and their mechanisms, discusses the most up-to-date methods for evaluation and structural assessment, and explains the best project management strategies from the feasibility stage through operations and maintenance. Numerous types of structures are examined and are further illustrated by relevant case studies. Features: Examines the probability of several types of structural failure and includes

reliability analysis. Presents best practices for predicting the structural lifetime for both onshore and offshore structures and reviews the most advanced methods for repair. Includes numerous practical case studies of structural failure and offers mitigation strategies depending of type of structure. Pushover analysis is a nonlinear static analysis tool widely used in practice to predict and evaluate seismic performance of structures. Since only the fundamental mode is considered and the inelastic theorem is imperfect for the conventional pushover analysis, a modified Modal Pushover Analysis (MPA) is proposed by researchers. In this thesis, the theories of dynamics for single-degree-of-freedom (SDOF) and multiple-degree-of-freedom (MDOF) are introduced, including elastic analysis and inelastic analysis. The procedures and equations for time history analysis, modal analysis, pushover analysis and modal pushover analysis are discussed in detail. Then an 8-story height model and a 16-story height model are established for analysis. The pushover analysis is conducted for each equivalent SDOF system, and by combination of the distribution of 1 mode, 2 modes and 3 modes, the responses of modal pushover analysis are obtained. The results of pushover analysis and modal pushover analysis are compared with those of time history analysis. The results of the analysis show that the conventional pushover analysis is mostly limited to low- and medium-rise structures in which only the first mode is considered and where the mode shape is constant. The modal pushover analysis is shown to have a superior accuracy in evaluation of seismic demands for higher buildings, especially for story drift ratios and column shears. With this in mind, some design recommendations and areas of future work are proposed in the conclusion. Earthquakes affecting urban areas can lead to catastrophic situations and hazard mitigation requires preparatory measures at all levels. Structural assessment is the diagnosis of the seismic health of buildings. Assessment is the prelude to decisions about rehabilitation or even demolition. The scale of the problem in dense urban settings brings about a need for macro seismic appraisal procedures because large numbers of existing buildings do not conform to the increased requirements of new earthquake codes and specifications or have other deficiencies. It is the vulnerable buildings - liable to cause damage and loss of life - that need immediate attention and urgent appraisal in order to decide if structural rehabilitation and upgrading are feasible. Current economic, efficient and occupant-friendly rehabilitation techniques vary widely and include the application either of precast concrete panels or layers, strips and patches of fiber reinforced polymers (FRP) in strategic locations. The papers in this book, many by renowned authorities in earthquake engineering, chart new and vital directions of research and application in the assessment and rehabilitation of buildings in seismic regions. While several papers discuss the probabilistic prediction and quantification of structural damage, others present approaches related with the in-situ and occupant friendly upgrading of buildings and propose both economical and practical techniques to address the problem. This book assembles, identifies and highlights the most recent developments in Rehabilitation and retrofitting of historical and heritage structures. This is an issue of paramount importance in countries with great built cultural heritage that also suffer from high seismicity, such as the countries of the eastern Mediterranean basin. Heritage structures range from traditional residential constructions to monumental structures, ancient temples, towers, castles, etc. It is generally recognized that these structures present particular difficulties in seismic response calculation through computer simulation due to the complexity of the structural system which is, generally, inhomogeneous, with several contact problems, gaps/joints, nonlinearities and brittleness in material constituents. This book contains selected papers from the ECCOMAS Thematic Conferences on Computational Methods in Structural Dynamics & Earthquake Engineering (COMPDYN) that were held in Corfu, Greece in 2011 and Kos, Greece in 2013. The Conferences brought together the scientific communities of Computational Mechanics, Structural Dynamics and Earthquake Engineering in an effort to facilitate the exchange of ideas in topics of mutual interest and to serve as a platform for establishing links between research groups with complementary activities. This book presents a collection of articles on the advanced and interdisciplinary application of innovative technologies. Scientific investigations and results of the conference 13th Days of Bosnian-Herzegovinian American Academy of Art and Sciences held in Sarajevo, Bosnia and Herzegovina, June 23-26, 2022, are

presented in this book. The up-to-date advances in various fields of engineering have been presented through numerous papers spanning the disciplines of civil engineering, mechanical engineering, advanced electrical power systems, computer modeling and simulations for engineering applications, computer science and artificial intelligence, geodesy and geoinformation, data science and geographic information systems and information and communication technologies. The editors would like to extend special gratitude to all the chairs of the planned symposia of the 13th Days of BHAAAS for their dedicated work in the production of this book. Rapid extraction of gas in the north-eastern Groningen province of the Netherlands has led to an increase in the occurrence of induced earthquakes in the region due to subsidence of gas bearing sandstone layers. This process manifests itself in the form of ground motions at the surface. Netherlands, historically being an inactive tectonic zone, has not paid much attention to detail structures withstand lateral seismic forces in the past. This has led to an alarming situation amongst the residents and government authorities since damage has been reported in the form of claims for compensation. The predominant presence of old masonry houses has further aggravated the situation because of quasi-brittle material characteristics weak in tension. A large-scale research campaign was launched after the historical seismic event at Huizinge in 2012 with an aim to assess and safeguard building structures in the region although much of the research has been focussed on behaviour of masonry houses. NPR 9998 which serves as a national guideline in the Netherlands for seismic assessment and retrofitting was published and is continuously being updated with the latest developments. However, it is equally important to address other typology of structures in terms of material and geometry. With this objective, it was decided to start with a fundamental study on the seismic analysis methods with specific regards to steel structures.The present thesis provides a comprehensive review of the lateral behaviour of affected structure initially and the fundamental differences in the induced earthquakes when compared with deep tectonic earthquakes. This is followed by state-of-the-art of linear and nonlinear seismic analysis methods which forms the basis of guidelines & codes presented in the NPR 9998 and EN 1998 context. Further, an understanding on the generation of seismic action in response spectrum format from recorded ground motions which is the most widely adopted one across seismic design codes worldwide. The case study adopted for this study is a steel office building preliminary designed for non-seismic actions. Global seismic demands are determined using linear-static and linear-dynamic analysis methods with verification of specific criteria to be satisfied for safety of steel structures. Modelling parameters and methodologies are discussed in detail with regards to using simplified numerical models for analysis based on recommendations from Eurocodes and Internaltional codes. A variation model to assess the likely performance level using nonlinear static pushover analysis for a specific intensity of ground motion in terms of peak ground acceleration was made. Conclusions in the form of applicability of analysis methods are made towards the end with affected structures primarily vibrating in the fundamental mode, the present study can serve as a reference guide for a practicing engineer carrying out seismic analysis. Discussions about the background of design principles is made alongside the analysis for a clear understanding.This thesis is expected to fill the knowledge gap for a design engineer carrying out seismic assessment of structures in the Groningen region of the Netherlands by providing a fundamental understanding of seismic demands imposed on a structure and assessment of capacity deficiency by carrying out non-linear pushover analysis. Recommendations based on NPR, Euro codes and International codes have been made to simplify numerical modelling of the structure. Similar analysis can be undertaken for other types of structures prone to be affected by induced earthquakes by adopting corresponding material nonlinear models and considering level of interaction with the ground in terms of soil-structure interaction where the same may lead to modification of structural response. The Bled workshops have traditionally produced reference documents providing visions for the future development of earthquake engineering as foreseen by leading researchers in the field. The participants of the 2011 workshop built on the tradition of these events initiated by Professors Fajfar and Krawinkler to honor their important research contributions and have now produced a book providing answers to

crucial questions in today's earthquake engineering: "What visible changes in the design practice have been brought about by performance-based seismic engineering? What are the critical needs for future advances? What actions should be taken to respond to those needs?" The key answer is that research interests should go beyond the narrow technical aspects and that the seismic resilience of society as a whole should become an essential part of the planning and design process. The book aims to provide essential guidelines for researchers, professionals and students in the field of earthquake engineering. It will also be of particular interest for all those working at insurance companies, governmental, civil protection and emergency management agencies that are responsible for assessing and planning community resilience. The introductory chapter of the book is based on the keynote presentation given at the workshop by the late Professor Helmut Krawinkler. As such, the book includes Helmut's last and priceless address to the engineering community, together with his vision and advice for the future development of performance-based design, earthquake engineering and seismic risk management. Safety, Reliability, Risk and Life-Cycle Performance of Structures and Infrastructures contains the plenary lectures and papers presented at the 11th International Conference on STRUCTURAL SAFETY AND RELIABILITY (ICOSSAR2013, New York, NY, USA, 16-20 June 2013), and covers major aspects of safety, reliability, risk and life-cycle performance of str Original research on performance of materials under a wide variety of blasts, impacts, severe loading and fireCritical information for protecting buildings and civil infrastructure against human attack, deterioration and natural disastersTest and design data for new types of concrete, steel and FRP materials This technical book is devoted to the empirical and theoretical analysis of how structures and the materials constituting them perform under the extreme conditions of explosions, fire, and impact. Each of the 119 fully refereed presentations is published here for the first time and was selected because of its original contribution to the science and engineering of how materials, bridges, buildings, tunnels and their components, such as beams and pre-stressed parts, respond to potentially destructive forces. Emphasis is placed on translating empirical data to design recommendations for strengthening structures, including strategies for fire and earthquake protection as well as blast mitigation. Technical details are provided on the development and behavior of new resistant materials, including reinforcements, especially for concrete, steel and their composites. This set of proceedings is based on the International Conference on Advances in Building Technology in Hong Kong on 4-6 December 2002. The two volumes of proceedings contain 9 invited keynote papers, 72 papers delivered by 11 teams , and 133 contributed papers from over 20 countries around the world. The papers cover a wide spectrum of topics across the three technology sub-themes of structures and construction, environment, and information technology. The variety within these categories spans a width of topics, and these proceedings provide readers with a good general overview of recent advances in building research. Ce ne sont pas les séismes qui tuent mais l'effondrement des constructions. C'est ainsi au génie parasismique, au travers de la réglementation, de concevoir des ouvrages résistants à l'aléa sismique dit réglementaire. Cependant, sachant que ces règles se sont améliorées en même temps que notre connaissance du phénomène naturel et des événements passés, force est de constater que la majorité des centres urbains est composée de bâtiments anciens, conçus selon des concepts et des règles de l'art souvent inadaptés au contexte sismique. Savoir évaluer la vulnérabilité des constructions existantes est donc une étape indispensable à une meilleure gestion du risque sismique et de sa politique de prévention. Après quelques rappels essentiels suivis d'exemples, cet ouvrage décrit des développements récents sur l'évaluation sismique de zones urbaines constituées d'un grand nombre de structures, dans des contextes à sismicité modérée (France, Suisse) ou forte (Italie, Grèce). The book presents research papers presented by academicians, researchers, and practicing structural engineers from India and abroad in the recently held Structural Engineering Convention (SEC) 2014 at Indian Institute of Technology Delhi during 22 – 24 December 2014. The book is divided into three volumes and encompasses multidisciplinary areas within structural engineering, such as earthquake engineering and structural dynamics, structural mechanics, finite element methods, structural vibration control, advanced cementitious and composite materials,

bridge engineering, and soil-structure interaction. Advances in Structural Engineering is a useful reference material for structural engineering fraternity including undergraduate and postgraduate students, academicians, researchers and practicing engineers. 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. This, conference proceeding, book contains invited articles and contributory papers from the 2nd International Symposium on Disaster Resilience and Sustainable Development, organized by Asian Institute of Technology, Thailand, on June 24–25, 2021. It includes contributions from researchers and practitioners working in the area of disaster mitigation and risk reduction for sustainable communities. The articles cover the topics such as on tools and techniques of hazard identifications, risk assessment, engineering innovations for hazard mitigation, and safe design of structures to the vulnerable systems. The content caters to research scholars, students, industry professionals, data analytics companies, re-insurance companies, government bodies and policymakers, who work in the field of hazard modeling and disaster management. Following the great progress made in computing technology, both in computer and programming technology, computation has become one of the most powerful tools for researchers and practicing engineers. It has led to tremendous achievements in computer-based structural engineering and there is evidence that current devel- ments will even accelerate in the near future. To acknowledge this trend, Tongji University, Vienna University of Technology, and Chinese Academy of Engine- ing, co-organized the International Symposium on Computational Structural En- neering 2009 in Shanghai (CSE'09). CSE'09 aimed at providing a forum for presentation and discussion of sta- of-the-art development in scientific computing applied to engineering sciences. Emphasis was given to basic methodologies, scientific development and engine- ing applications. Therefore, it became a central academic activity of the Inter- tional Association for Computational Mechanics (IACM), the European Com- nity on Computational Methods in Applied Sciences (ECCOMAS), The Chinese Society of Theoretical and Applied Mechanic, the China Civil Engineering So- ety, and the Architectural Society of China. A total of 10 invited papers, and around 140 contributed papers were p- sented in the proceedings of the symposium. Contributors of papers came from 20 countries around the world and covered a wide spectrum related to the compu- tional structural engineering. Gain Confidence in Modeling Techniques Used for Complicated Bridge StructuresBridge structures vary considerably in form, size, complexity, and importance. The methods for their computational analysis and design range from approximate to refined analyses, and rapidly improving computer technology has made the more refined and complex methods of ana This conference proceedings brings together the work of researchers and practising engineers concerned with computational modelling of complex concrete, reinforced concrete and prestressed concrete structures in engineering practice. The subjects considered include computational mechanics of concrete and other cementitious materials, including masonry. Advanced discretisation methods and microstructural aspects within multi-field and multi-scale settings are discussed, as well as modelling formulations and constitutive modelling frameworks and novel experimental programmes. The conference also considered the need for reliable, high-quality analysis and design of concrete structures in regard to safety-critical structures, with a view to adopting these in codes of practice or recommendations. The book is of special interest to researchers in computational mechanics, and industry experts in complex nonlinear simulations of concrete structures. Trends in the Analysis and Design of Marine Structures

is a collection of the papers presented at MARSTRUCT 2019, the 7th International Conference on Marine Structures held in Dubrovnik, Croatia, 6-8 May 2019. The MARSTRUCT series of Conferences started in Glasgow, UK in 2007, the second event of the series having taken place in Lisbon, Portugal in March 2009, the third in Hamburg, Germany in March 2011, the fourth in Espoo, Finland in March 2013, the fifth in Southampton, UK in March 2015, and the sixth in Lisbon, Portugal in May 2017. This Conference series specialises in dealing with Ships and Offshore Structures, addressing topics in the fields of: - Methods and Tools for Loads and Load Effects - Methods and Tools for Strength Assessment - Experimental Analysis of Structures - Materials and Fabrication of Structures - Methods and Tools for Structural Design and Optimisation - Structural Reliability, Safety and Environmental Protection. Trends in the Analysis and Design of Marine Structures is an essential document for academics, engineers and all professionals involved in the area of analysis and design of Ships and Offshore Structures. About the series: The 'Proceedings in Marine Technology and Ocean Engineering' series is devoted to the publication of proceedings of peer-reviewed international conferences dealing with various aspects of 'Marine Technology and Ocean Engineering'. The Series includes the proceedings of the following conferences: the International Maritime Association of the Mediterranean (IMAM) conferences, the Marine Structures (MARSTRUCT) conferences, the Renewable Energies Offshore (RENEW) conferences and the Maritime Technology (MARTECH) conferences. The 'Marine Technology and Ocean Engineering' series is also open to new conferences that cover topics on the sustainable exploration and exploitation of marine resources in various fields, such as maritime transport and ports, usage of the ocean including coastal areas, nautical activities, the exploration and exploitation of mineral resources, the protection of the marine environment and its resources, and risk analysis, safety and reliability. The aim of the series is to stimulate advanced education and training through the wide dissemination of the results of scientific research. This book is focused on the seismic vulnerability assessmentmethods, applied to existing buildings, describing severalbehaviors and new approaches for assessment on a large scale (urbanarea). It is clear that the majority of urban centers are composed of oldbuildings, designed according to concepts and rules that areinadequate to the seismic context. How to assess the vulnerabilityof existing buildings is an essential step to improve themanagement of seismic risk and its prevention policy. After somekey reminders, this book describes seismic vulnerability methodsapplied to a large number of structures (buildings and bridges) inmoderate (France, Switzerland) and strong seismic prone regions(Italy, Greece). Contents 1. Seismic Vulnerability of Existing Buildings: Observationaland Mechanical Approaches for Application in Urban Areas, SergioLagomarsino and Serena Cattari. 2. Mechanical Methods: Fragility Curves and Pushover Analysis,Caterina Negulescu and Pierre Gehl. 3. Seismic Vulnerability and Loss Assessment for Buildings inGreece, Andreas J. Kappos. 4. Experimental Method: Contribution of Ambient VibrationRecordings to the Vulnerability Assessment, Clotaire Michel andPhilippe Guéguen. 5. Numerical Model: Simplified Strategies for Vulnerability SeismicAssessment of Existing Structures, Cédric Desprez, PanagiotisKotronis and Stéphane Grange. 6. Approach Based on the Risk Used in Switzerland, PierinoLestuzzi. 7. Preliminary Evaluation of the Seismic Vulnerability of ExistingBridges, Denis Davi. About the Authors Philippe Guéguen is a Senior IFSTTAR Researcher at ISTerre,Joseph Fourier University Grenoble 1, France Document from the year 2018 in the subject Engineering - Civil Engineering, grade: 1, , language: English, abstract: The study objective in this book is to demonstrate an assessment methodology through studying a local existing building, which was designed under gravity loads only. Based on the above, the case study building is assessed using an NSP that is called capacity spectrum method (CSM) as per ATC-40. The behavior of the structure is generated using nonlinear pushover analyses. The seismic assessment was conducted based on FEMA 356 performance criteria. According to FEMA 356, there are two approaches for seismic evaluation: global-level and member-level with three performance levels, which are immediate occupancy (IO), life safety (LS) and collapse prevention (CP). In addition, seismic design requirements that are mentioned in ASCE 7-10 were conducted in order to assess the building for irregularities. In Palestine, The seismic design of new

buildings is mandatory. However, there are many existing buildings were mostly designed under the influence of gravity loads. Such buildings may stand vulnerable to earthquakes and thus need to be strengthened; so that they become safe. To achieve the required level of strengthening, advanced analysis and assessment tools must be used. There is a lack of studies in Palestine that provide practical "know-how" guidelines for local engineers on the assessment of existing buildings against seismic loads. Generally, the guidelines written in foreign codes (e.g. the ASCE or FEMA) are very broad and general and may pose a challenge to local engineers regarding the consistency of their implementation. This study bridges this gap between local engineers and international codes by putting these guidelines into action through a practical case study. Generally, four procedures are available for seismic analysis of buildings: two linear procedures, and two nonlinear procedures. The nonlinear procedures include the nonlinear static procedure (NSP) and nonlinear dynamic procedure (NDP). NSP's are deemed to be very practical tools to assess the nonlinear seismic performance of structures. On the other hand, NDP's require detailed input data, and it is very time-consuming, which is a relevant drawback in design offices, where the deadlines are restrictive. Also, this method does not exist in Palestine neither local earthquake records, nor specialized powerful programs for NDP. This makes the NSP best choice for practical assessment of buildings. 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 The book is a tribute to the research contribution of Professor Andrei Reinhorn in the field of earthquake engineering. It covers all the aspects connected to earthquake engineering starting from computational methods, hybrid testing and control, resilience and seismic protection which have been the main research topics in the field of earthquake engineering in the last 30 years. These were all investigated by Prof. Reinhorn throughout his career. The book provides the most recent advancements in these four different fields, including contributions coming from six different countries giving an international outlook to the topics. This book contains 9 invited keynote and 12 theme lectures presented at the 14th European Conference on Earthquake Engineering (14ECEE) held in Ohrid, Republic of Macedonia, from August 30 to September 3, 2010. The conference was organized by the Macedonian Association for Earthquake Engineering (MAEE), under the auspices of European Association for Earthquake Engineering (EAEE). The book is organized in twenty one state-of-the-art papers written by carefully selected very eminent researchers mainly from Europe but also from USA and Japan. The contributions provide a very comprehensive collection of topics on earthquake engineering, as well as interdisciplinary subjects such as engineering seismology and seismic risk assessment and management. Engineering seismology, geotechnical earthquake engineering, seismic performance of buildings, earthquake resistant engineering structures, new techniques and technologies and managing risk in seismic regions are all among the different topics covered in this book. The book also includes the First Ambraseys Distinguished Award Lecture given by Prof. Theo P. Tassios in the honor of Prof. Nicholas N. Ambraseys. The aim is to present the current state of knowledge and engineering practice, addressing recent and ongoing developments while also projecting innovative ideas for future research and development. It is not always possible to have so many selected manuscripts within the broad spectrum of earthquake engineering thus the book is unique in one sense and may serve as a good reference book for researchers in this field. Audience: This book will be of interest to civil engineers in the fields of geotechnical and structural earthquake engineering; scientists and researchers in the fields of seismology, geology and geophysics. Not only scientists, engineers and students, but also those interested in earthquake hazard assessment and mitigation will find in this book the most recent advances. Until now, information on the dynamic loading of structures has been widely scattered. No other book has examined the different types of loading in a comprehensive and systematic manner, and looked at their signficance in the design process. The

book begins with a survey of the probabilistic background to all forms of loads, which is particularly important to dynamic loads, and then looks at the main types in turn: wind, earthquake, wave, blast and impact loading. The relevant code provisions (Eurocode and UBC American) are detailed and a number of examples are used to illustrate the principles. A final section covers the analysis for dynamic loading, drawing out the concepts underlying the treatment of all dynamic loads, and the corresponding modelling techniques. Throughout there is a focus on the modelling of structures, rather than on classical structural dynamics. This book provides information on the latest technological developments taking place in Geotechnical engineering, pertaining to Soil Dynamics and Modelling of Geotechnical Problems. The book is useful for the academicians and working professionals with coverage of both theoretical and practical aspects of Dynamics of Soil and Modelling studies on Geotechnical problems based on research findings and site specific inputs. The book serves as a useful reference resource for graduate and postgraduate students of civil engineering and contents of the book are helpful to the postgraduate students and research scholars in carrying out the research. These proceedings, arising from an international workshop, present research results and ideas on issues of importance to seismic risk reduction and the development of future seismic codes. The book focuses on the use of inelastic analysis methods for the seismic assessment and design of bridges, for which the work carried out so far, albeit interesting and useful, is nevertheless clearly less than that for buildings. Although some valuable literature on the subject is currently available, the most advanced inelastic analysis methods that emerged during the last decade are currently found only in the specialised research-oriented literature, such as technical journals and conference proceedings. Hence the key objective of this book is two-fold, first to present all important methods belonging to the aforementioned category in a uniform and sufficient for their understanding and implementation length, and to provide also a critical perspective on them by including selected case-studies wherein more than one methods are applied to a specific bridge and by offering some critical comments on the limitations of the individual methods and on their relative efficiency. The book should be a valuable tool for both researchers and practicing engineers dealing with seismic design and assessment of bridges, by both making the methods and the analytical tools available for their implementation, and by assisting them to select the method that best suits the individual bridge projects that each engineer and/or researcher faces. COST is an intergovernmental framework for European Cooperation in Science and Technology, allowing the coordination of nationally-funded research on a European level. Part of COST was COST Action C26Urban Habitat Constructions Under Catastrophic Events which started in 2006 and held its final conference in Naples, Italy, on 16-18 September 201 This book is intended to serve as a textbook for engineering courses on earthquake resistant design. The book covers important attributes for seismic design such as material properties, damping, ductility, stiffness and strength. The subject coverage commences with simple concepts and proceeds right up to nonlinear analysis and push-over method for checking building adequacy. The book also provides an insight into the design of base isolators highlighting their merits and demerits. Apart from the theoretical approach to design of multi-storey buildings, the book highlights the care required in practical design and construction of various building components. It covers modal analysis in depth including the important missing mass method of analysis and tension shift in shear walls and beams. These have important bearing on reinforcement detailing. Detailed design and construction features are covered for earthquake resistant design of reinforced concrete as well as confined and reinforced masonry structures. The book also provides the methodology for assessment of seismic forces on basement walls and pile foundations. It provides a practical approach to design and detailing of soft storeys, short columns, vulnerable staircases and many other components. The book bridges the gap between design and construction. Plenty of worked illustrative examples are provided to aid learning. This book will be of value to upper undergraduate and graduate students taking courses on seismic design of structures. This book presents the select proceedings of the International Conference on Civil Engineering Trends and Challenges for Sustainability (CTCS 2020). The chapters discuss emerging and latest research and advances in sustainability in different areas of civil engineering, which aim to provide

solutions to sustainable development. The contents are broadly divided into the following categories: construction technology and building materials, structural engineering, transportation and geotechnical engineering, environmental and water resources engineering, and RS-GIS applications. This book will be of potential interest to beginners, researchers, and professionals working in the area of sustainable civil engineering and related fields.

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