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Statistical Analysis of the Seismic Vulnerability of Mid-South Building Structures - Andrew Kary Mehdi Assadollahi 2010

A study of buildings in Shelby County, Tennessee and Tipton County, Tennessee was conducted using a sidewalk survey procedure developed by the Federal Emergency Management Agency (FEMA), known as a Rapid Visual Survey (RVS). Its purpose is to identify buildings that are potentially at risk to a seismic event. A database of these buildings was generated from the data gathered in the RVS procedure. A loss estimation program developed by FEMA, known as HAZUS-MH MR3, was used to perform a more detailed analysis on the structures utilizing user defined ground motion maps. A rank of the structures was developed based upon the RVS procedure and the HAZUS output.FEMA developed HAZUS-MH MR3 which estimates structural and non-structural losses for a variety of hazards. In this study, three earthquake scenarios were analyzed: a magnitude 6.5 earthquake based upon site-specific ground motion maps, a magnitude 7.7 earthquake based upon site-specific ground motion maps, and a magnitude 7.7 earthquake based upon ground motion maps provided by the United States Geological Survey (USGS). All of these ground motion maps simulate a desired earthquake scenario to perform a loss estimate of the buildings; however, the site-specific, user-supplied maps have many more unique ground motion parameters than the USGS maps. HAZUS provides loss estimates by computing damage state probabilities for each building. One objective of this research is to develop a prioritization of the structures based upon building performance from the HAZUS loss estimate and the RVS procedure, which has a possible application to air emergency planners in selecting suitable locations to be used as mass population shelters in the case of a seismic event. The second objective of this research is to assess how well the RVS procedure performs in identifying structures which may be seismically at risk as compared to the HAZUS output by performing a statistical analysis and hypothesis testing on the data. The results of this objective can be utilized in determining if the RVS procedure is suitable for the seismic evaluation of structures or it a more detailed, site specific analysis should be performed using hazard software like HAZUS. The third objective is to investigate how the building type and the construction time period of structures affect the results of HAZUS and the RVS using statistical analysis. The results of the third objective can help in determining which construction materials perform better in a seismic event, which can have structural design applications for regions of high seismicity. The last objective is to examine how the effects of site specific ground motion maps compare with those provided by the USGS, in HAZUS loss estimates. .

Seismic Structural Health Monitoring - Maria Pina Limongelli 2019-04-24

This book includes a collection of state-of-the-art contributions addressing both theoretical developments in, and successful applications of, seismic structural health monitoring (S2HM).

Over the past few decades, Seismic SHM has expanded considerably, due to the growing demand among various stakeholders (owners, managers and engineering professionals) and researchers. The discipline has matured in the process, as can be seen by the number of S2HM systems currently installed worldwide. Furthermore, the responses recorded by S2HM systems hold great potential, both with regard to the management of emergency situations and to ordinary maintenance needs. The book's 17 chapters, prepared by leading international experts, are divided into four major sections. The first comprises six chapters describing the specific requirements of S2HM systems for different types of civil structures and infrastructures (buildings, bridges, cultural heritage, dams, structures with base isolation devices) and for monitoring different phenomena (e.g. soil-structure interaction and excessive drift). The second section describes available methods and computational tools for data processing, while the third is dedicated to hardware and software tools for S2HM. In the book's closing section, five chapters report on state-of-the-art applications of S2HM around the world.

Assessment of The Seismic Vulnerability of West Tennessee School Buildings - Christine Maurice Moore 2019

West Tennessee is a seismically active area. However, West Tennessee has been building structures long before strides in earthquake engineering. The Federal Emergency Management Agency (FEMA) developed a procedure, Rapid Visual Screening (RVS) Method, to quickly determine if a structure is likely to suffer major damage from earthquake or not by documenting aspects of the structure and its site and then calculating a score for the building that indicates the seismic vulnerability of the structure. A more sophisticated government software called Hazus-MH was developed to produce results with five damage categories: None, Slight, Moderate, Extensive, and Complete. It costs more to run Hazus-MH as opposed to the RVS Method. The West Tennessee Seismic Safety Commission has funded a project for The University of Memphis to assess the seismic resistance of West Tennessee school buildings.

SYNER-G: Typology Definition and Fragility Functions for Physical Elements at Seismic Risk - K. Pitilakis 2014-01-20

Fragility functions constitute an emerging tool for the probabilistic seismic risk assessment of buildings, infrastructures and lifeline systems. The work presented in this book is a partial product of a European Union funded research project SYNER-G (FP7 Theme 6: Environment) where existing knowledge has been reviewed in order to extract the most appropriate fragility functions for the vulnerability analysis and loss estimation of the majority of structures and civil works exposed to earthquake hazard. Results of other relevant European projects and international initiatives are also incorporated in the book. In several cases new fragility and vulnerability functions have been developed in order to better represent the specific characteristics of European elements at risk. Several European and non-European institutes and Universities collaborated efficiently to capitalize upon existing knowledge. State-of-the-art methods are described, existing fragility curves are reviewed and, where necessary, new ones are proposed for buildings, lifelines, transportation infrastructures as well as for utilities and critical facilities. Taxonomy and typology definitions are synthesized and the treatment of related uncertainties is discussed. A fragility function manager tool and fragility functions in electronic form are provided on extras.springer.com. Audience The book aims to be a standard reference on the fragility functions to be used for the seismic vulnerability and probabilistic risk assessment of the most important elements at risk. It is of particular interest to earthquake engineers, scientists and researchers working in the field of earthquake risk assessment, as well as the insurance industry, civil protection and emergency management agencies.

ICISA documentation - Wolfgang Kromp 1995

Advances in Energy Science and Equipment Engineering II Volume 1 - Shiquan Zhou 2017-09-19

The 2016 2nd International Conference on Energy Equipment Science and Engineering (ICEESE 2016) will be held on November 12-14, 2016 in Guangzhou, China. ICEESE 2016 is to

bring together innovative academics and industrial experts in the field of energy equipment science and engineering to a common forum. The primary goal of the conference is to promote research and developmental activities in energy equipment science and engineering and another goal is to promote scientific information interchange between researchers, developers, engineers, students, and practitioners working all around the world. The conference will be held every year to make it an ideal platform for people to share views and experiences in energy equipment science and engineering and related areas.

Structures and Stochastic Methods - A.S. Cakmak 2013-10-22

Despite advances in the field of geotechnical earthquake engineering, earthquakes continue to cause loss of life and property in one part of the world or another. The Third International Conference on Soil Dynamics and Earthquake Engineering, Princeton University, Princeton, New Jersey, USA, 22nd to 24th June 1987, provided an opportunity for participants from all over the world to share their expertise to enhance the role of mechanics and other disciplines as they relate to earthquake engineering. The edited proceedings of the conference are published in four volumes. This volume covers: Structures, Dams, Retaining Walls and Slopes, Underground Structures, and Stochastic Methods. Together with its companion volumes, it is hoped that it will contribute to the further development of techniques, methods and innovative approaches in soil dynamics and earthquake engineering.

Deterministic Numerical Modeling of Soil Structure Interaction - Stephane Grange 2022-01-26

In order to describe soil–structure interaction in various situations (nonlinear, static, dynamic, hydro-mechanical couplings), this book gives an overview of the main modeling methods developed in geotechnical engineering. The chapters are centered around: the finite element method (FEM), the finite difference method (FDM), and the discrete element method (DEM). Deterministic Numerical Modeling of Soil–Structure Interaction allows the reader to explore the classical and well-known FEM and FDM, using interface and contact elements available for coupled hydro-mechanical problems. Furthermore, this book provides insight on the DEM, adapted for interaction laws at the grain level. Within a classical finite element framework, the concept of macro-element is introduced, which generalizes constitutive laws of SSI and is particularly straightforward in dynamic situations. Finally, this book presents the SSI, in the case of a group of structures, such as buildings in a town, using the notion of metamaterials and a geophysics approach.

EARTHQUAKE RESISTANT DESIGN AND RISK REDUCTION, 2ND EDITION - David J. Dowrick 2011-07

Market_Desc: PrimaryPractising earthquake professionals, including researchers, designers, risk advisors and managers, engineers, architects and planners.SecondaryPost-graduate engineering and architectural students, and senior under-graduate engineering and architectural students. Special Features: · Covers all topics required to carry out effective earthquake resistant design and risk reduction.· Provides valuable practical guidance for practising engineers· Discusses the new topics of the creation of low-damage structures and the spatial distribution of ground shaking near large fault ruptures· Includes numerous illustrations and pedagogical features such as tables, graphs, maps, construction details, photos, diagrams of structures, diagrams of site conditions, plots of material/structural behaviour, flow charts, response spectra and case studies· Features extensive and effective cross-referencing to facilitate further research into chosen areas About The Book: Earthquake Resistant Design and Risk Reduction, 2nd edition is based upon global research and development work over the last 50 years or more, and follows the author s series of three books Earthquake Resistant Design, 1st and 2nd editions (1977 and 1987), and Earthquake Risk Reduction (2003). Many advances have been made since the 2003 edition of Earthquake Risk Reduction, and there is every sign that this rate of progress will continue apace in the years to come. Compiled from the author s wide design and research experience in earthquake engineering and engineering seismology, this key text provides an excellent treatment of the complex multidisciplinary

process of earthquake resistant design and risk reduction.

Effect of Early Age Drying Shrinkage on the Seismic Response of RC Structures - Chaimaa Jaafari 2020

Reinforced Concrete (RC) structures get damaged over time due to many factors: thermal conditions, chemical attacks, shrinkage, creep, carbonation, corrosion, etc. This damaging process starts at early-age and continues with structure aging. Early age damage can have a significant impact on the dynamic behavior of reinforced concrete structures. In fact, the natural frequency of a structure, which is a design parameter can be highly reduced due to this damage. In order to quantify the impact of early-age damage (0 to 28 days) on the seismic response of a reinforced concrete structure, this thesis combined both numerical modeling and pseudo-dynamic tests on two types of RC portal frames. The first one was kept in endogenous conditions (water exchange with the surrounding environment was prevented) during its early age period in a way to limit drying effects leading to cracks. As for the second one, it was kept in non-endogenous conditions (possibility of water exchange with the surrounding environment) similar to construction site conditions, which induced an initial damage (cracks apparition) due to a more important drying shrinkage. Both types of RC portal frames were subjected after their early age period to the same seismic loading using pseudodynamic tests. On the one hand, this manuscript presents the experimental results obtained through the use of pseudodynamic tests in order to evaluate the behavior of the two types of RC structures under a moderate intensity earthquake. The structures were instrumented using optical fiber sensors, displacement and load sensors, velocimeters and monitored using Digital Image Correlation. On the other hand, the enhanced multifiber beam model that was developed for the portal frames in order to follow their early age damage and to determine their static and dynamic behavior while accounting for their early age effects is presented. In this numerical model, shrinkage and concrete thermal deformations are calculated and then introduced as inputs of a coupled damage model accounting for creep and mechanical deformations. Such model was validated by comparing its results to the ones obtained experimentally, which made it possible to evaluate the evolution of frequency content of the two types of structures during early age and to quantify their difference of behavior in the non-linear domain. Work conducted within this thesis thus allowed proposing a complete model for reinforced concrete structures that can be used in order to follow their damage evolution from casting until being subjected to a seismic load and to quantify their seismic vulnerability.

Between Two Earthquakes - Sir Bernard M. Feilden 1987-10-01

This handbook addresses three areas of concern for the museum administrator concerning the protection of historic buildings, monuments, and archaeological sites located in seismic areas. It proposes pre-disaster measures such as taking accurate and complete documentation (photogrammetry is discussed in one of the 13 appendixes), risk awareness, planning, maintenance and inspections, etc. Second, when an earthquake strikes, the immediate emergency steps necessary to protect life and property are indicated; and after the earthquake, the strengthening of valuable cultural property (based on the Modified Mercalli Intensity Scale, also in an appendix) should be included in the general program of prevention maintenance along with the repairs discussed in detail applicable to each architectural element, and to the site as a whole.

Geotechnical Applications for Earthquake Engineering: Research Advancements - Sitharam, T.G. 2012-04-30

Disaster preparedness and response management is a burgeoning field of technological research, and staying abreast of the latest developments within the field is a difficult task. Geotechnical Applications for Earthquake Engineering: Research Advancements has collected chapters from experts from around the world in a variety of applications, frameworks, and methodologies, and prepared them in a form that serves as a handy reference and research guide to practitioners and academics alike. By protecting society with earthquake engineering, the latest research can make the world a safer place.

Handbook of Materials Failure Analysis with

Case Studies from the Chemicals, Concrete and Power Industries - Abdel Salam Hamdy Makhlouf 2015-09-07
Handbook of Materials Failure Analysis: With Case Studies from the Chemicals, Concrete and Power Industries provides an in-depth examination of materials failure in specific situations, a vital component in both developing and engineering new solutions. This handbook covers analysis of materials failure in the chemical, power, and structures arenas, where the failure of a single component can result in devastating consequences and costs. Material defects, mechanical failure as a result of improper design, corrosion, surface fracture, and other failure mechanisms are described in the context of real world case studies involving steam generators, boiler tubes, gas turbine blades, welded structures, chemical conversion reactors and more. This book is an indispensable reference for engineers and scientists studying the mechanisms of failure in these fields. Introduces readers to modern analytical techniques in materials failure analysis Combines foundational knowledge with current research on the latest developments and innovations in the field Includes many compelling case studies of materials failure in chemical processing plants, concrete structures, and power generation systems

Software and Intelligent Sciences: New Transdisciplinary Findings - Wang, Yingxu 2012-03-31
The junction of software development and engineering combined with the study of intelligence has created a bustling intersection of theory, design, engineering, and conceptual thought.Software and Intelligent Sciences: New Transdisciplinary Findings sits at a crossroads and informs advanced researchers, students, and practitioners on the developments in computer science, theoretical software engineering, cognitive science, cognitive informatics, and intelligence science. The crystallization of accumulated knowledge by the fertilization of these areas, have led to the emergence of a transdisciplinary field known as software and intelligence sciences, to which this book is an important contribution and a resource for both fields alike.

Salt Lake City International Airport Expansion - 1992

Earthquake Engineering - Gerald Duma 1995-01-01
These papers cover such topics as: siesmicity and seismic risk; strong ground motion and site effects; dynamic properties and stability of soils; soil-structure-interaction; foundation and seismic isolation; interpretation of damage in recent earthquakes; and methods of analysis and design.

Earthquake Engineering - Alberto Bernal 1992-01-01
The official proceedings of the 10th world conference on earthquake engineering in Madrid. Coverage includes damage in recent earthquakes, seismic risk and hazard, site effects, structural analysis and design, seismic codes and standards, urban planning, and expert system application.

Seismic Vulnerability of Structures - Philippe Gueguen 2013-03-05
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

Seismic Risk Assessment of Reinforced Concrete Buildings Using Fuzzy Based Techniques - Solomon Tesfamariam 2008

Product Development of Earthquake-safe Houses and Schools - Mohammad Samsamshariat 2011-01

Millions of people worldwide are in urgent need of affordable houses. According to the statistics, these people are mainly living in developing countries with a relatively high level of seismic risk and low to medium incomes. While traditional practices are unable to cope with currently high demands, large number of fatalities and wide spread damages during last earthquakes show that houses in many regions of the world are seismically vulnerable. This work aims at developing a simple and low-cost solution, inspired by good performance of traditional low-rise structures in Germany, known as "Fachwerkhaus." Therefore, the main parameters of this good performance are realized and adopted for the recommended solution, called systematically braced frames. To assure a high quality, an off-site prefabrication of main safety-relevant structural elements under strict supervision is supported here, while the rest of the structure can be accomplished by local labor, to generate local jobs, and using available materials, to provide cultural acceptance and to minimize costs. As required for the seismic study, horizontal stiffness and ductility are investigated analytically during the work.

On the Difference in the Seismic Risk for Normal and Tall Structures at the Same Site - A. Galanopoulos 1977

U.S. Geological Survey Professional Paper - 1984

Earthquake Engineer 10th World - World Conference on Earthquake Engineering (10, 1992, Madrid) 1992-01-01

Seismic Risk Analysis for Nuclear Energy Facilities - Zhaoliang Wang 2015

Earthquakes are destructive natural disasters that can inflict various levels of damage on engineering structures and lead to other adverse consequences. Accurate seismic risk quantification of critical engineering structures such as nuclear power plants is of great importance, not only for answering public safety concern but also for facilitating risk-informed decision making. Seismic Probabilistic Risk Analysis (SPRA) has been widely used for seismic analysis and design of critical engineering structures. It combines the probabilistic model of the behavior of structural response given a ground-motion parameter (GMP) value (e.g., seismic fragility model) and the Probabilistic Seismic Hazard Analysis (PSHA) for the GMP in a mathematically rigorous manner. However, there are a number of issues on the engineering application of SPRA that need to be addressed before it can be readily implemented into current engineering practice. In current SPRA practice, both the fragility model and PSHA are based on a single GMP, which is adequate for the single-mode-dominant structures. For multiple-mode-dominant structures, whose response could be better predicted using multiple GMP,a vector-valued SPRA is conceptually more appropriate. However, vector-valued SPRA requires extensive computational efforts and extensive consultation of vector-valued PSHA from seismologists,which prevent it from being ready for engineering purposes. The objective of this study is to bridge the gaps between seismological analyses and engineering applications, i.e., to address the immediate issues in current vector-valued SPRA so that it can be readily applied into engineering practice. A new seismic hazard deaggregation procedure is developed for seismic risk analysis, which determines a set of controlling earthquakes that induce dominant hazard to the site of interest. A simplified approach to vector-valued SPRA is developed based on the controlling earthquakes. Integration over all possible earthquake occurrences in standard vector-valued SPRA is then avoided,which

substantially improves the computational efficiency without losing accuracy. This overcomes the deficiencies and preserves the advantages of standard vector-valued SPRA. To facilitate performing the simplified approach, factors affecting the accuracy of the simplified approach are discussed and illustrated through the numerical examples. In addition, seismic capacity evaluation of nuclear facilities is an important task in a SPRA. However, following the current evaluation procedures, inconsistency in seismic capacity estimates are often obtained for the same facility in similar plants at different locations. The inconsistency also shows dependency on the GMP selected for defining seismic capacity. This inconsistency is conceptually undesirable for engineering purposes. To characterize the possible factors affecting the consistency in seismic capacity estimates, a comprehensive parametric study is performed in an analytical manner. Theoretical derivations and graphical illustrations are resorted to facilitate the analysis. Both general and case-by-case analyses are performed to show how each of these factors affects the consistency in seismic capacity estimates. This parametric study represents a wide coverage of seismic capacity evaluating problems for nuclear facilities, and hence can be used for interpreting results of similar kinds in current engineering practice.

Earthquake Geotechnical Engineering - Kyriazis D. Pitilakis 2007-06-14

This book contains the full papers on which the invited lectures of the 4th International Conference on Geotechnical Earthquake Engineering (4ICEGE) were based. The conference was held in Thessaloniki, Greece, from 25 to 28 June, 2007. The papers offer a comprehensive overview of the progress achieved in soil dynamics and geotechnical earthquake engineering, examine ongoing and unresolved issues, and discuss ideas for the future.

Digital Filters for Earthquake Site Studies - Hendrik D. Carleton 1975

The objective of this study was to develop a computerized technique for processing strong-motion accelerograms from earthquakes in order that earthquake vulnerability for existing structures can be more fully investigated through the use of simplified base excitations. Through filter theory, the Wiener normal equations were used to reduce accelerogram pairs to basic time histories called operators. This approach isolates the differences contained within accelerogram pairs from project sites at which the data were obtained. The operators are used with mathematical shocks (such as half-sine pulses) as inputs to produce simplified responses. Variations in the simplified responses are obtained by changing the durations of the half-sine or other hypothetical wave form inputs and using the same operator for each variation. Each family of responses is then studied to determine its sensitivity to these changes. As an example of this theory, data from an earthquake of magnitude 4.4 + or - were used to construct operators that related free-field motions to those on the main and auxiliary dams at the Isabella Reservoir near Bakersfield, California. Based on the results of this study, it is concluded that use of this technique should enable structural engineers to assess earthquake vulnerability for existing structures more fully, and that this in turn could lead to improvements in future designs.

Recent Challenges and Advances in Geotechnical Earthquake Engineering - Sitharam, T.G. 2018-08-24

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. Recent Challenges and Advances in Geotechnical Earthquake Engineering provides innovative insights into the methods of structural engineering techniques, as well as disaster management strategies. The content within this publication represents the work of rock fracturing, hazard analysis, and seismic acceleration. It is a vital reference source for civil engineers, researchers, and academicians, and covers topics centered on improving a structure’s safety, stability, and resistance to seismic hazards.

Vrancea Earthquakes: Tectonics, Hazard and Risk Mitigation - F. Wenzel 2012-12-06

This volume contains the most relevant peer-reviewed papers presented at The First

International Workshop on Vrancea Earthquakes, held in Bucharest on November 1-4, 1997. Strong earthquakes in the Romanian Vrancea area have caused a high toll of casualties and extensive damage over the last several centuries. With a moment magnitude of 7.4, the 1977 earthquake caused more than 1500 casualties, the majority of them in Bucharest. The contributions address key problems of seismotectonics of the Vrancea area and related strong ground motion, hazard assessment, site effects and microzonation, structural damage and earthquake resistant design, risk assessment and disaster management from an international and regional perspective. This list of topics shows the diverse contributions from the multidisciplinary fields of geosciences, geophysics, seismology, geology, civil engineering, city planning, and emergency relief practices. This book is of value for scientists interested in earthquake hazard and seismic risk research as well as for seismologists, geophysicists and Earth scientists. It is also useful for authorities responsible for public safety and natural hazard mitigation plans and for insurance companies.

China Seismic Experimental Site - Yong-Gang Li 2022-05-10

This book introduces an integrated conceptual framework of the China Seismic Experimental Site (CSES), describes its scientific challenges and research priorities, and reports preliminary results coming out of observational infrastructure in seismology, tectonophysics, geodesy, geophysics and geochemistry. Preliminary community fault model, community velocity model, and community strain rate model in the CSES are described in this book. A multidisciplinary test observation system includes GNSS, seismic array, and deep drilling system under construct around middle segment of the Xiansuihe-Xiaojiang fault and other seismogenic faults in the CSES which are also introduced. This book introduces multidisciplinary topics and a wide spectrum of solid earth system to describe various disciplines, methods, and techniques through the CSES. This book presents a vision of the CSES that is dedicated to deepen the scientific understanding of continental earthquake preparation and occurrence and enhance the disaster resilience of the society. It aims at establishing a field laboratory of earthquake science, in which international and interdisciplinary cooperation could be fostered and supported. Contents of this book include the following: • History of Seismic Experiment Sites in the World. • Launching of CSES Project: Seismicity, Existed Earthquake Monitoring Networks, and Historical Seismic Disasters. • Seismotectonics and Geodynamics of the Eastern Margin of the Tibetan Plateau with Implication for the CSES. • Theoretical Framework of CSES in View of Natural Science and in view of Social Science. • Updated Earthquake Monitoring Network in China. • CSES Community Models of Geology, Structure, and Deformation. • Earthquake Forecasting Models. • CSES Products: Massive Data Procession and Distribution. • A Review of the Field Expedition of the June 17, 2019, Changning, Sichuan, M6.0 Earthquake. • Rupture Structure and Earthquake Risk of the South Longmenshan Fault Viewed by Guided Waves. • Seismic Risk Assessment. • Model of a Seismic Experimental Site with Application to the Comparative Study between CSES and ASES.

Recent Advances in Earthquake Engineering in Europe - Kyriazis Pitilakis 2018-04-24

This book is a collection of invited lectures including the 5th Nicholas Ambraseys distinguished lecture, four keynote lectures and twenty-two thematic lectures presented at the 16th European Conference on Earthquake Engineering, held in Thessaloniki, Greece, in June 2018. The lectures are put into chapters written by the most prominent internationally recognized academics, scientists, engineers and researchers in Europe. They address a comprehensive collection of state-of-the-art and cutting-edge topics in earthquake engineering, engineering seismology and seismic risk assessment and management. The book is of interest to civil engineers, engineering seismologists, seismic risk managers, policymakers and consulting companies covering a wide spectrum of fields from geotechnical and structural earthquake engineering, to engineering seismology and seismic risk assessment and management. Scientists,

professional engineers, researchers, civil protection policymakers and students interested in the seismic design of civil engineering structures and infrastructures, hazard and risk assessment, seismic mitigation policies and strategies, will find in this book not only the most recent advances in the state-of-the-art, but also new ideas on future earthquake engineering and resilient design of structures. Chapter 1 of this book is available open access under a CC BY 4.0 license.

Buildings at Risk - Christopher Arnold 1994-01-01

Explores how to make well-informed decisions when planning and designing earthquake-resistant buildings. Describes ground motion and its impact on buildings, impact of site conditions on seismic vulnerability, how to work with strucutral engineers, how to interpret seismic codes, and how to incorporate good siesmic design in renovating existing structures.

Assessment of the Seismic Vulnerability of Wall Pier Supported Highway Bridges on Priority Emergency Routes in Southern Illinois - John Lewis Bignell 2006

Coupled Site and Soil-Structure Interaction Effects with Application to Seismic Risk Mitigation - Tom Schanz 2009-06-18

Proceedings of the NATO Advanced Research Workshop on Coupled Site and Soil-Structure Interaction Effects with Application to Seismic Risk Mitigation Borovets, Bulgaria 30 August - 3 September 2008

The Seismic Design Handbook - Farzad Naeim 2012-12-06

This handbook contains up-to-date existing structures, computer applications, and infonnation 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 infonnation. It represents important publications: an attempt to bridge the persisting gap between l. 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 Guidelinesfor 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.

Earthquake Engineering - P. Bisch 1998-01-01

This text details the proceedings of the 11th European Conference on Earthquake Engineering. CD-ROM contains full text of the 650 papers in printed form. This would have been 6 volumes of 1000 pages each. Topics covered: are: Engineering seismology; Experimental aspects for soils, rocks and construction material; Computational aspects for materials, structures and soil-structure interaction; Civil engineering projects; Active and passive isolation; Industrial facilities, lifelines and equipment; Vulnerability, seismic risk and strengthening; Site effects and spatial variability of seismic motions; Reliability analyses and probabilistic aspects; Design criteria, codees and standards; Eurocode 8 and national applications; Seismic risk in the Mediterranean basin; Post earthquake investigations;

Earthquake Risk Assessment of Reinforced Concrete Bridges in Washington State Using Pushover Analysis - Abigail B. Christman 2017

The average age of reinforced concrete bridges

in the state of Washington is 48 years, encompassing more than 100 years of design and construction techniques, which reflect evolving views on seismic risk and mitigation. As such, there is great uncertainty as to the actual seismic resistance of existing bridges. Having a simple and accurate process for assessing the seismic vulnerability of a bridge can help identify vulnerable design details and address them, either through retrofit or replacement. Using pushover analysis to determine the seismic capacity of structures can give an idea of the overall vulnerability of the structure while decreasing the computational power needed to perform analyses as compared to nonlinear time history (NLTH) analysis. Using the finite element program RUAUMOKO-2D, models of existing WSDOT bridges were created and pushover analyses were run. By defining damage states of interest and determining the associated displacement profiles, peak ground accelerations (PGAs) of seismic events were then correlated to the damage states. By combining fragility curves encompassing the probabilistic distribution of the PGA at which a damage state might occur with site hazard risks, Risk Indices were calculated for all bridges considered. The bridges were ranked in order to contextualize the Risk Index values. The results of the assessment process were then verified by comparing them to the results of NLTH analysis.

Earthquake Resistant Engineering Structures VI - C. A. Brebbia 2007

The problem of protecting the built environment in earthquake-prone regions of the world involves not only the optimal design and construction of new facilities, but also the upgrading and rehabilitation of existing structures and infrastructures. The latter is a laborious and expensive task, which can be accomplished only gradually. However, the inestimable loss of life and the colossal costs following a major earthquake in a metropolitan area provide sufficient reason to make it an important challenge for the scientific and technical community.Containing papers presented at the Sixth International Conference on Earthquake Resistance and Engineering Structures, this book will be invaluable to engineers, scientists and managers working in industry, academia, research organizations and governments. The book encompasses a wide range of topics such as: Site Effects and Geotechnical aspects; Earthquake resistant design; Seismic Behaviour and Vulnerability; Structural Dynamics; Monitoring and Testing; Bridges; Heritage Buildings; Masonry Construction; Retrofitting; Passive Protection Devices and Seismic Isolation; Lifelines; Design Codes and Response Spectre.

5th International Conference on Geotechnical and Highway Engineering - S. P. R. Wardani 2011

This proceedings contains 89 papers from 25 countries and regions, including 14 keynote lectures and 17 invited lectures, presented at the Third International Conference on Geotechnical Engineering for Disaster Mitigation and Rehabilitation (3ICGEDMAR 2011) together with the Fifth International Conference on Geotechnical & Highway Engineering (5ICGHE), which was held in Semarang, Indonesia, from 18 to 20 May 2011. This is the third conference in the GEDMAR conference series. The first was held in Singapore from 12 to 13 December 2005 and the second in Nanjing, China, from 30 May to 2 June 2008. The proceedings is divided into three sections: keynote papers, invited papers and conference papers under which there are six sub-sections: Case Studies on Recent Disasters; Soil Behaviours and Mechanisms for Hazard Analysis; Disaster Mitigation and Rehabilitation Techniques; Risk Analysis and Geohazard Assessment; Innovation Foundations for Rail, Highway, and Embankments; and Slope Failures and Remedial Measures. The conference is held under the auspices of the International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE) Technical Committee TC-303: Coastal and River Disaster Mitigation and Rehabilitation, TC-203: Earthquake Geotechnical Engineering and Associated Problems, TC-302: Forensic Geotechnical Engineering, TC-304: Engineering Practice of Risk Assessment and Management, TC-213: Geotechnics of Soil Erosion, TC-202: Transportation Geotechnics, TC-211: Ground Improvement, Southeast Asian Geotechnical Society (SEAGS), Association of Geotechnical Societies in Southeast Asia (AGSSEA), and Road Engineering Association of Asia & Australasia

(REAAA).

Seismic Reliability of Dam Structures - Sindhuja Sundaresan 2015-03-04

Reliability analysis of structures implies the estimate of the limit state probabilities of a structure under adverse/environmental loading. Most important aspect of seismic reliability analysis is identification of all uncertainties, methods for modeling and analysis, analytical formulation of the limit state surface and integration of probability density function. In the seismic reliability analysis of the dam structure, the limit state probability of the structure is integrated with the seismic risk of the site. In this study, Coulee concrete gravity dam structure is modeled and seismic reliability of the dam structure in the presence of full reservoir and empty reservoir are analyzed. The dam-reservoir and reservoir-foundation interactions are considered in the study. The transient analysis is done by considering El Centro and Loma Prieta earthquake record. The randomness of ground motion, uncertainties in its occurrence, definition of its intensity parameters are considered in seismic reliability analysis. The material uncertainty of the dam is included in the study.

Earthquake Engineering - Alberto Bernal 1992-01-01

The official proceedings of the 10th world conference on earthquake engineering in Madrid. Coverage includes damage in recent earthquakes, seismic risk and hazard, site effects, structural analysis and design, seismic codes and standards, urban planning, and expert system application.