

The Earthquake Standards New Zealand

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 Bulletin of the New Zealand Society for Earthquake Engineering

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New Zealand Standard Seismic Restraint of Building Contents International Monetary Fund
 Talking about earthquake engineering, this second edition is intended for practising structural engineers, including those with little or no knowledge of the subject, and also for advanced engineering students. It discusses the provisions of seismic codes, particularly Eurocode 8.
New Challenges for Seismic Risk Mitigation in Urban Areas Springer Science & Business Media
 This comprehensive and well-organized book presents the concepts and principles of earthquake resistant design of structures in an easy-to-read style. The use of these principles helps in the implementation of seismic design practice. The book adopts a step-by-step approach, starting from the fundamentals of structural dynamics to application of seismic codes in analysis and design of structures. The text also focusses on seismic evaluation and retrofitting of reinforced concrete and masonry buildings. The text has been enriched with a large number of diagrams and solved problems to reinforce the understanding of the concepts. Intended mainly as a text for undergraduate and postgraduate students of civil engineering, this text would also be of considerable benefit to practising engineers, architects, field engineers and teachers in the field of earthquake resistant design of structures.
Precast-concrete buildings in seismic areas Getty Publications
 Health monitoring of civil structures (HMS) is a new discipline, which contributes to successful and on time detection of damages to structures. This book is a collection of chapters on different topics written by leading scientists in the field. It is primarily focused on the latest achievements in monitoring the earthquake effect upon the health of civil structures. The first chapter of the book deals with the geotechnical and structural aspects of the 2010-2011 Christchurch earthquakes. Further chapters are dedicated to the latest HMS techniques of identification of damage to structures caused by earthquakes. Real time damage detection as well as sensors and acquisition systems used for that purpose are presented. The attention is focused on automated modal analysis, dynamic artificial neural networks and wavelet techniques used in HMS. Particular emphasis is put on wireless sensors and piezo-impedance transducers used for evaluation of seismically induced structural damage. The discussion is followed by presentation of case studies of application of health monitoring for buildings and other civil structures, including a super tall structure. The book ends with a presentation of shaking table tests on physical models for the purpose of monitoring their behaviour under earthquake excitation. Audience The book is primarily intended for engineers and scientists working in the field of application of the HMS technique in earthquake engineering. Considering that real time health monitoring of structures represents a sophisticated approach applying the latest techniques of monitoring of structures, many experts from other industries will also find this book useful.
Seismic Design and Performance Springer Nature
 Original research on performance of materials under a wide variety of blasts, impacts, severe loading and fire. Critical information for protecting buildings and civil infrastructure against human attack, deterioration and natural disasters. Test 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.

Soil-Foundation-Structure Interaction Springer Science & Business Media

Recent earthquakes have demonstrated that despite the continuous developments of novel materials and new strengthening techniques, the majority of the existing structures are still unprotected and at high seismic risk. The repair and strengthening framework is a complex process and there are often barriers in the preventative upgrade of the existing structures related to the cost of the applications and the limited expertise of the engineers. The engineers need to consider various options thoroughly and the selection of the appropriate strategy is a crucial parameter for the success of these applications. The main aim of this collection is to present a number of different approaches applied to a wide range of structures with different characteristics and demands acting as a practical guide for the main repair and strengthening approaches used worldwide. This document contains a collection of nine case studies from six different countries with different seismicity (i.e. Austria, Greece, Italy, Mexico, Nepal and New Zealand). Various types of structures have been selected with different structural peculiarities such as buildings used for different purposes (i.e. school buildings, town hall, 30 storey office tower), a bridge, and a wharf. Most of the examined structures are Reinforced Concrete structures while there is also an application on a Masonry building. For each of the examined studies, the local conditions are described followed by the main deficiencies which are addressed. The methods used for the assessment of the in-situ conditions also presented and alternative strategies for the repair and strengthening are considered.

Earthquake Geotechnical Engineering for Protection and Development of Environment and Constructions Springer Nature

This open access book originates from an international workshop organized by Turkish Natural Catastrophe Insurance Pool (TCIP) in November 2019 that gathered renown researchers from academia, representatives of leading international reinsurance and modeling companies as well as government agencies responsible of insurance pricing in Turkey. The book includes chapters related to post-earthquake damage assessment, the state-of-art and novel earthquake loss modeling, their implementation and implication in insurance pricing at national, regional and global levels, and the role of earthquake insurance in building resilient societies and fire following earthquakes. The rich context encompassed in the book makes it a valuable tool not only for professionals and researchers dealing with earthquake loss modeling but also for practitioners in the insurance and reinsurance industry.

Seismic Design of Precast Concrete Building Structures Springer Nature

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.

New Zealand fib Fédération internationale du béton

9th STESSA 2018 Selected, peer reviewed papers from the 9th International Conference on the Behaviour of Steel Structures in Seismic Areas (STESSA 2018), February 14-17, 2018, Christchurch, New Zealand

Critical comparison of major seismic codes for buildings Victoria University Press

"Provides procedures for the determination of earthquake actions on structures in New Zealand. It gives the requirements for verification procedures, site hazard determination, the evaluation of structural characteristics, structural analysis for earthquake action effects, the determination and limits for deformations and the seismic design of parts of structures. It is to be applied in conjunction with AS/NZS 1170 parts 0, 1, 2 and 3. Appendices cover aspects of ultimate limit state design and the requirements for material specific structural design standards that are able to be used in conjunction with NZS 1170.5."--Page 2.

Bulletin of the New Zealand National Society for Earthquake Engineering Thomas Telford

This document has a broad scope and is not focussed on design issues. Precast construction under seismic conditions is treated as a whole. The main principles of seismic design of different structural systems, their behavior and their construction techniques are presented through rules, construction steps and sequences, procedures, and details that should lead to precast structures built in seismic areas complying with the fundamental performance requirements of collapse prevention and life safety in major earthquakes and limited damage in more frequent earthquakes. The content of this document is largely limited to conventional precast construction and, although some information is provided on the well-known "PRESS technology" (jointed ductile dry connections), this latter solution is not treated in detail in this document. The general overview, contained in this document, of alternative structural systems and connection solutions available to achieve desired performance levels, intends to provide engineers, architects, clients, and end-users (in general) with a better appreciation of the wide range of applications that modern precast concrete technology can have in various types of construction from industrial to commercial as well as residential. Lastly, the emphasis on practical aspects, from conceptual design to connection detailing, aims to help engineers to move away from the habit of blindly following prescriptive codes in their design, but instead go back to basic principles, in order to achieve a more robust understanding, and thus control, of the seismic behaviour of the structural system as a whole, as well as of its components and individual connections.

DSIR International Association for Bridge and Structural Engineering (IABSE)

Seismic Retrofit of Existing Buildings is a concise and easy-to-use guideline for practising engineers to assess and design successful seismic retrofit interventions for existing vulnerable buildings. It offers readers guidance on both conceptual design strategies and relevant detailed design considerations.

Earthquake Design Practice for Buildings Trans Tech Publications Ltd

The aim of this state-of-art report is to present current practices for use of precast and prestressed concrete in countries in seismic regions, to recommend good practice, and to discuss current developments. The report has been drafted by 30 contributors from nine different countries. This state-of-art report covers: state of the practice in various countries; advantages and disadvantages of incorporating precast reinforced and prestressed concrete in construction; lessons learned from previous earthquakes; construction concepts; design approaches; primary lateral load resisting systems (precast and prestressed concrete frame systems and structural walls including dual systems) diaphragms of precast and prestressed concrete floor units; modelling and analytical methods; gravity load resisting systems; foundations; and miscellaneous elements (shells, folded plates, stairs and architectural cladding panels). Design equations are reported where necessary, but the emphasis is on principles. Ordinary cast-in-place reinforced concrete is not considered in this report. This fib state-of-the-art report is intended to assist designers and constructors to provide safe and economical applications of structural precast concrete and at the same time to allow innovation in design and construction to continue. This Bulletin N° 27 was approved as an fib state-of-art report in autumn 2002 by fib Commission 7, Seismic design.

Structural Design Actions John Wiley & Sons

New Zealand's recovery has stalled since mid-2010. Spare capacity has helped contain inflation. The Reserve Bank of New Zealand (RBNZ) lifted its policy rate in two steps from a record low of 2.5 percent to 3 percent in mid-2010. The exchange rate appreciated and financial markets have largely recovered from the global financial crisis. The banking sector remains profitable and is dominated by four subsidiaries of Australian banks that performed well during the crisis. The 2010 Canterbury earthquakes have disrupted economic activity, reduced wealth, and weakened confidence.

EARTHQUAKE RESISTANT DESIGN OF STRUCTURES fib Fédération internationale du béton
fib Bulletin 69 illustrates and compares major buildings seismic codes applied in the different Continents, namely U.S., Japan, New Zealand, Europe, Canada, Chile and Mexico. Bulletin 69 was prepared by Task Group 7.6 of fib Commission 7, under the leadership of the late Professor Robert (Bob) Park which, in tandem with Professor Paulay, had developed in the seventies new fundamental design concepts, most notably capacity design approach and structural design for ductility, that had made the NZ seismic Code the most advanced one of the time. This new approach has highly influenced the development of Eurocode 8, to which Bob Park has significantly contributed. Bob Park was also well informed of the situation in Japan, USA, Canada and South America. Such a wide view is reflected in Bulletin 69 showing similarities and differences among the major seismic codes, accompanied as far as possible by comments, hopefully useful for fostering international harmonization. A comprehensive summary of the major codes is provided in the first chapter of the bulletin. All codes are separately presented according to a common framework: an introduction section, which describes the history, the philosophy, the process development, the performance-based criteria, the strength of materials and the incorporation of strength reduction factors of each code; a second section devoted to the demand side, which specify the seismic design actions and associated criteria of each code for areas of different seismicity and for structures with different ductility properties/requirements; a third section devoted to the capacity side, which describes the capacities of members and joints and associated criteria of each code, including member strengths in flexure, shear and bars anchorage, desirable hierarchies of strength attainment, deformation capacities of mechanisms of inelastic deformation, detailing of beams, columns and structural walls, detailing of beam-column joints for shear and the detailing of diaphragms. The second chapter is devoted to the comparison of the more significant issues dealt in the considered codes. This includes: seismic design actions and associated criteria, capacity design practice, beams, columns,

confinement, structural walls and joints. It is felt that fib Bulletin 69 represents a useful, unique instrument for rapidly gaining an overview of the distinguishing features of the major world codes, under both their conceptual framework and application rules.

Response of Structures Under Extreme Loading FIB - Féd. Int. du Béton

This book presents the proceedings of the fib Symposium "Building for the future: Durable, Sustainable, Resilient", held in Istanbul, Turkey, on 5-7 June 2023. The book covers topics such as concrete and innovative materials, structural performance and design, construction methods and management, and outstanding structures. fib (The International Federation for Structural Concrete) is a not-for-profit association whose mission is to develop at an international level the study of scientific and practical matters capable of advancing the technical, economic, aesthetic, and environmental performance of concrete construction.

Bulletin of the New Zealand National Society for Earthquake Engineering CRC Press

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.

Case Studies on Conservation and Seismic Strengthening/Retrofitting of Existing Structures CRC Press

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. New topics include the creation of low-damage structures and the spatial distribution of ground shaking near large fault ruptures. Sections on guidance for developing countries, response of buildings to differential settlement in liquefaction, performance-based and displacement-based design and the architectural aspects of earthquake resistant design are heavily revised. This book: Outlines individual national weaknesses that contribute to earthquake risk to people and property Calculates the seismic response of soils and structures, using the structural continuum "Subsoil - Substructure - Superstructure - Non-structure" Evaluates the effectiveness of given design and construction procedures for reducing casualties and financial losses Provides guidance on the key issue of choice of structural form Presents earthquake resistant design methods for the main four structural materials - steel, concrete, reinforced masonry and timber - as well as for services equipment, plant and non-structural architectural components Contains a chapter devoted to problems involved in improving (retrofitting) the existing built environment This book is an invaluable reference and guiding tool to practising civil and structural engineers and architects, researchers and postgraduate students in earthquake engineering and engineering seismology, local governments and risk management officials.

Building for the Future: Durable, Sustainable, Resilient Frontiers Media SA

Earthquake Geotechnical Engineering for Protection and Development of Environment and Constructions contains invited, keynote and theme lectures and regular papers presented at the 7th International Conference on Earthquake Geotechnical Engineering (Rome, Italy, 17-20 June 2019).

The contributions deal with recent developments and advancements as well as case histories, field monitoring, experimental characterization, physical and analytical modelling, and applications related to the variety of environmental phenomena induced by earthquakes in soils and their effects on engineered systems interacting with them. The book is divided in the sections below: Invited papers Keynote papers Theme lectures Special Session on Large Scale Testing Special Session on Liquefact Projects Special Session on Lessons learned from recent earthquakes Special Session on the Central Italy earthquake Regular papers Earthquake Geotechnical Engineering for Protection and Development of Environment and Constructions provides a significant up-to-date collection of recent experiences and developments, and aims at engineers, geologists and seismologists, consultants, public and private contractors, local national and international authorities, and to all those involved in research and practice related to Earthquake Geotechnical Engineering.

Earthquake Resistant Design and Risk Reduction Springer

Landslides and Engineered Slopes. Experience, Theory and Practice contains the invited lectures and all papers presented at the 12th International Symposium on Landslides, (Naples, Italy, 12-19 June 2016). The book aims to emphasize the relationship between landslides and other natural hazards. Hence, three of the main sessions focus on Volcanic-induced landslides, Earthquake-induced landslides and Weather-induced landslides respectively, while the fourth main session deals with Human-induced landslides. Some papers presented in a special session devoted to "Subareal and submarine landslide processes and hazard" and in a "Young Session" complete the books. Landslides and Engineered Slopes. Experience, Theory and Practice underlines the importance of the classic approach of modern science, which moves from experience to theory, as the basic instrument to study landslides. Experience is the key to understand the natural phenomena focusing on all the factors that play a major role. Theory is the instrument to manage the data provided by experience following a mathematical approach; this allows not only to clarify the nature and the deep causes of phenomena but mostly, to predict future and, if required, manage similar events. Practical benefits from the results of theory to protect people and man-made works. Landslides and Engineered Slopes. Experience, Theory and Practice is useful to scientists and practitioners working in the areas of rock and soil mechanics, geotechnical engineering, engineering geology and geology.

Advances in Structural Engineering CRC Press

This volume presents select papers presented at the 7th International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics. The papers discuss advances in the fields of soil dynamics and geotechnical earthquake engineering. Some of the themes include seismic design of deep & shallow foundations, soil structure interaction under dynamic loading, marine structures, etc. A strong emphasis is placed on connecting academic research and field practice, with many examples, case studies, best practices, and discussions on performance based design. This volume will be of interest to researchers and practicing engineers alike.

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