

Seismic Design Guidelines For Port Structures Pianc

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.

There is a perennial gap between theory and practice, between academia and active professionals in the field of disaster management. This gap means that valuable lessons are not learned and people die or suffer as a result. This book opens a dialogue between theory and practice. It offers vital lessons to practitioners from scholarship on natural hazards, disaster risk management and reduction and developments studies, opening up new insights in accessible language with practical applications. It also offers to academics the insights of the enormous experience practitioners have accumulated, highlighting gaps in research and challenging assumptions and theories against the reality of experience.

Disaster Management covers issues in all phases of the disaster cycle: preparedness, prevention, response and recovery. It also addresses cross-cutting issues including political, economic and social factors that influence differential vulnerability, and key areas of practice such as vulnerability mapping, early warning, infrastructure protection, emergency management, reconstruction, health care and education, and gender issues. The team of international authors combine their years of experience in research and the field to offer vital lessons for practitioners, academics and students alike.

Marine Concrete Structures: Design, Durability and Performance comprehensively examines structures located in, under, or in close proximity to the sea. A major emphasis of the book is on the long-term performance of marine concrete structures that not only represent major infrastructure investment and provision, but are also required to operate with minimal maintenance. Chapters review the design, specification, construction, and operation of marine concrete structures, and examine their performance and durability in the marine environment. A number of case studies of significant marine concrete structures from around the world are included which help to reinforce the principles outlined in earlier chapters and provide useful background to these types of structures. The result is a thorough and up-to-date reference source that engineers, researchers, and postgraduate students in this field will find invaluable. Covers, in detail, the design, specification, construction, and operation of marine concrete structures Examines the properties and performance of concrete in the marine environment Provides case studies on significant marine concrete structures and durability-based design from around the world

Seismic Guidelines for Ports was prepared by the Ports Committee of the Technical Council on Lifeline Earthquake Engineering of the American Society of Civil Engineers, a committee of experienced professionals for port authorities, government, consulting engineering firms, and the academic community. This volume includes lessons of experience from past earthquakes; a summary of current state of knowledge and practice of risk reduction planning through design, analysis and material components; and guidelines for response and recovery at ports.

This comprehensive book covers all major aspects of the design and maintenance of port facilities, including port planning, design loads for today's larger vessel size, seismic design guidelines, and breakwater design. New material addresses environmental concerns, the latest developments on inter-modal hubs and transfer points, and the latest information on port security and procedures being implemented around the world.

Collection of selected, peer reviewed papers from the 2nd International Conference on Advances in Computational Modeling and Simulation (ACMS 2013), July 17-19, 2013, Kunming, China. Volume is indexed by Thomson Reuters CPCI-S (WoS). The 316 papers are grouped as follows: Chapter 1: Computational Solid Mechanics; Chapter 2: Computational Fluid Dynamics; Chapter 3: Applied Mathematics; Chapter 4: Computational Analyze of Nonlinear Systems; Chapter 5: Applied Computational Methods in Engineering Research; Chapter 6: Computational Methods in Fire Safety; Chapter 7: Other Related Topics

For centuries, jetties and wharfs have been designed and built around the world and play an important role in contemporary ports. The difference in the use of jetties, piers and wharfs is that jetties are frequently used for the transshipment and storage of light materials and ro-ro traffic, while piers are generally used for heavy loads like iron ore. That is why piers are mostly designed and constructed like quay walls (which are beyond the scope of this handbook). The designs were originally based on trial and error and the insights of those who dared to conquer local conditions, such as wind, waves, currents and soil composition. Design and construction techniques have since evolved into the designs we see on the coast or in river ports and seaports nowadays. The purpose of this handbook is to provide insight and guidelines regarding aspects that are important in the design of jetties and wharfs. Jetty-specific issues such as loads, interfaces between materials, installations on jetties and wharfs, as well as detailing aspects, are also covered. This

handbook is part of a series of Dutch port infrastructure design recommendations that include the Quay Walls handbook and Jetties and Wharfs handbook.

The mitigation of earthquake-related hazards represents a key role in the modern society. The mitigation of such kind of hazards spans from detailed studies on seismicity, evaluation of site effects, and seismo-induced landslides, tsunamis as well as and the design and analysis of structures to resist such actions. The study of earthquakes ties together science, technology and expertise in infrastructure and engineering in an effort to minimize human and material losses when they inevitably occur. Chapters deal with different topics aiming to mitigate geo-hazards such as: Seismic hazard analysis, Ground investigation for seismic design, Seismic design, assessment and remediation, Earthquake site response analysis and soil-structure interaction analysis.

This edited book's theme is organized as a part of the GeoMEast 2019 International Congress and Exhibition that was held in Cairo, Egypt, on November 10–14 2019. The editors like to express their deep appreciation and gratitude to the authors for their valuable contributions to the GeoMEast 2019 proceedings and to all session chairs and reviewers for their sincere efforts to make this book a reality. The editors are very grateful to have this opportunity to participate in organizing this GeoMEast 2019 conference and hope that this book theme is a valuable reference to the civil/geotechnical engineering community worldwide.

This book, whose primary aim is to describe liquefaction processes and their implications for marine structures such as pipelines, sea outfalls, quay walls and caisson breakwaters, discusses the subject of soil liquefaction in the marine environment. In addition, the physics of liquefaction (including examples illustrating the catastrophic consequences of soil liquefaction with regard to marine structures) are described, and the mathematical modelling of liquefaction is treated in detail. Also, carefully selected numerical examples support the discussion of assessing liquefaction potential, and benchmark cases such as buried gas pipelines and their floatation, caisson breakwaters, cover stones and their interaction with liquefied soil along with counter measures are investigated. Contents: Introduction and Physics of Liquefaction Biot Equations and Their Solutions Residual Liquefaction Momentary Liquefaction Floatation of Buried Pipelines Sinking of Pipelines and Marine Objects Liquefaction Under Standing Waves Liquefaction at Gravity Structures Stability of Rock Berms in Liquefied Soil Impact of Seismic-Induced Liquefaction Counter Measures Readership: Professionals and researchers in the area of coastal, ocean and marine civil engineering; graduate and post graduate students. Key Features: Physics of liquefaction Mathematical modelling Assessment of liquefaction potential, supported by numerical examples Benchmark cases such as buried gas pipelines, caisson structures, etc. Keywords: Soil Liquefaction; Marine Environment; Mathematical Modelling; Pipelines; Caisson Breakwaters Reviews: "This is a well-written and comprehensive book describing the physics and processes of seabed liquefaction around marine structures. Overall, this book is highly recommended for all professionals and researchers interested in seabed soil liquefaction and the stability of marine structures, and is indeed suitable as a textbook for graduate/postgraduate students in this field." J. Ocean Eng. Mar. Energy

This book provides a timely review and summary of the recent advances in state-of-the-art earthquake geotechnics. The earthquake disasters in Japan and New Zealand in 2011 prompted the urgent need for the state-of-the-art earthquake geotechnics to be put into practice for disaster mitigation. By reviewing the developments in earthquake geotechnics over more than half a century, this unique book enables readers to obtain solid grasp of this discipline. It is based on contributions from 18 leading international experts, who met in Kyoto in June 2016 to discuss a range of issues related to the developments of earthquake geotechnics. It comprehensively discusses various areas of earthquake geotechnics, including performance-based seismic design; the evolution of geotechnical seismic response analysis from 1964-2015; countermeasures against liquefaction; solutions for nuclear power plant disasters; the tsunami-caused inundation of the Tokyo metropolitan area; and a series of state-of-the-art effective stress analyses of case histories from the 2011 East Japan Earthquake. The book is of interest to advanced level researchers and practicing engineers in the field of earthquake geotechnics.

"TRB's National Cooperative Highway Research Program (NCHRP) Synthesis 440, Performance-Based Seismic Bridge Design (PBSD) summarizes the current state of knowledge and practice for PBSD. PBSD is the process that links decision making for facility design with seismic input, facility response, and potential facility damage. The goal of PBSD is to provide decision makers and stakeholders with data that will enable them to allocate resources for construction based on levels of desired seismic performance"--Publisher's description.

Civil Engineering has recently seen enormous progress in the core field of the construction of deep foundations. This book is the result of the International Workshop on Recent Advances in Deep Foundations (IWDPF07), which was held in Yokosuka, Japan from the 1st to the 2nd of February, 2007. Topics under discussion in this book include recent research. This book gathers the latest advances, innovations, and applications in the field of computational geomechanics, as presented by international researchers and engineers at the 16th International Conference of the International Association for Computer Methods and Advances in Geomechanics (IACMAG 2020/21). Contributions include a wide range of topics in geomechanics such as: monitoring and remote sensing, multiphase modelling, reliability and risk analysis, surface structures, deep structures, dams and earth structures, coastal engineering, mining engineering, earthquake and dynamics, soil-atmosphere interaction, ice mechanics, landfills and waste disposal, gas and petroleum engineering, geothermal energy, offshore technology, energy geostructures, geomechanical numerical models and computational rail geotechnics.

The handbook contains a comprehensive compilation of topics that are at the forefront of many of the technical advances in ocean waves, coastal, and ocean engineering. More than 110 internationally recognized authorities in the field of coastal and ocean engineering have contributed articles in their areas of expertise to this handbook. These international

luminaries are from highly respected universities and renowned research and consulting organizations around the world. Pile foundations are the most common form of deep foundations that are used both onshore and offshore to transfer large superstructural loads into competent soil strata. This book provides many case histories of failure of pile foundations due to earthquake loading and soil liquefaction. Based on the observed case histories, the possible mechanisms of failure of the pile foundations are postulated. The book also deals with the additional loading attracted by piles in liquefiable soils due to lateral spreading of sloping ground. Recent research at Cambridge forms the backbone of this book with the design methodologies being developed directly based on quantified centrifuge test results and numerical analysis. The book provides designers and practicing civil engineers with a sound knowledge of pile behaviour in liquefiable soils and easy-to-use methods to design pile foundations in seismic regions. For graduate students and researchers, it brings together the latest research findings on pile foundations in a way that is relevant to geotechnical practice.

A collection of 54 papers selected for presentation at the 2nd FLAC Symposium. The contributions cover a wide range of topics from engineering applications to theoretical developments in the areas of embankment and slope stability, mining, tunnelling, and soil and structure interaction.

For the first time, international guidelines for seismic design of port structures have been compiled in this comprehensive book. These guidelines address the limitations inherent in conventional design, and establish the framework for an evolutionary design strategy based on seismic response and performance requirements. The provisions reflect the diverse nature of port facilities throughout the world, where the required functions of port structures, economic and social environment, and seismic activities may differ from region to region. This book comprises a main text and eight technical commentaries. The main text introduces the reader to basic earthquake engineering concepts and a strategy for performance-based design, while the technical commentaries illustrate specific aspects of seismic analysis and design, and provide examples of various applications of the guidelines. Proven simplified methods and state-of-the-art analysis procedures have been carefully selected and integrated in the guidelines in order to provide a flexible and consistent methodology for the seismic design of port facilities.

Tsunamis are water waves triggered by impulsive geologic events such as sea floor deformation, landslides, slumps, subsidence, volcanic eruptions and bolide impacts. Tsunamis can inflict significant damage and casualties both nearfield and after evolving over long propagation distances and impacting distant coastlines. Tsunamis can also effect geomorphologic changes along the coast. Understanding tsunami generation and evolution is of paramount importance for protecting coastal population at risk, coastal structures and the natural environment. Accurately and reliably predicting the initial waveform and the associated coastal effects of tsunamis remains one of the most vexing problems in geophysics, and -with few exceptions- has resisted routine numerical computation or data collection solutions. While ten years ago, it was believed that the generation problem was adequately understood for useful predictions, it is now clear that it is not, especially nearfield. By contrast, the runup problem earlier believed intractable is now well understood for all but the most extreme breaking wave events.

This edited volume is an up-to-date guide for students, policy makers and engineers on earthquake engineering, including methods and technologies for seismic hazard detection and mitigation. The book was written in honour of the late Professor Jai Krishna, who was a pioneer in teaching and research in the field of earthquake engineering in India during his decades-long work at the University of Roorkee (now the Indian Institute of Technology Roorkee). The book comprehensively covers the historical development of earthquake engineering in India, and uses this background knowledge to address the need for current advances in earthquake engineering, especially in developing countries. After discussing the history and growth of earthquake engineering in India from the past 50 years, the book addresses the present status of earthquake engineering in regards to the seismic resistant designs of bridges, buildings, railways, and other infrastructures. Specific topics include response spectrum superposition methods, design philosophy, system identification approaches, retaining walls, and shallow foundations. Readers will learn about developments in earthquake engineering over the past 50 years, and how new methods and technologies can be applied towards seismic risk and hazard identification and mitigation.

Earthquake Geotechnical Case Histories for Performance-Based Design is a collection of 26 case histories, each study containing well-instrumented geotechnical and earthquake data. The book is intended to serve as a reference work, since it contains a common scale to develop and implement design methodologies and numerical analyses, so that their re Earthquakes are nearly unique among natural phenomena - they affect virtually everything within a region, from massive buildings and bridges, down to the furnishings within a home. Successful earthquake engineering therefore requires a broad background in subjects, ranging from the geologic causes and effects of earthquakes to understanding the imp

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Without proper hydraulic fill and suitable specialised equipment, many major infrastructure projects such as ports, airports, roads, industrial or housing projects could not be realised. Yet comprehensive information about hydraulic fill is difficult to find. This thoroughly researched book, written by noted experts, takes the reader step-by-step through the complex development of a hydraulic fill project. Up-to-date and in-depth, this manual will enable the client and his consultant to understand and properly plan a reclamation project. It provides adequate guidelines for design and quality control and allows the contractor to work within known and generally accepted guidelines and reasonable specifications. The ultimate goal is to create better-designed, more adequately specified and less costly hydraulic fill projects. The

Hydraulic Fill Manual covers a range of topics such as:

- The development cycle of a hydraulic fill project
- How technical data are acquired and applied
- The construction methods applicable to a wide variety of equipment and soil conditions, the capabilities of dredging equipment and the techniques of soil improvement
- How to assess the potentials of a borrow pit
- Essential environment assessment issues
- The design of the hydraulic fill mass, including the boundary conditions for the design, effects of the design on its surroundings, the strength and stiffness of the fill mass, density, sensitivity to liquefaction, design considerations for special fill material such as silts, clays and carbonate sands, problematic subsoils and natural hazards
- Quality control and monitoring of the fill mass and its behaviour after construction.

This manual is of particular interest to clients, consultants, planning and consenting authorities, environmental advisors, contractors and civil, geotechnical, hydraulic and coastal engineers involved in dredging and land reclamation projects.

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 developments will even accelerate in the near future. To acknowledge this trend, Tongji University, Vienna University of Technology, and Chinese Academy of Engineering, co-organized the International Symposium on Computational Structural Engineering 2009 in Shanghai (CSE'09). CSE'09 aimed at providing a forum for presentation and discussion of state-of-the-art development in scientific computing applied to engineering sciences. Emphasis was given to basic methodologies, scientific development and engineering applications. Therefore, it became a central academic activity of the International Association for Computational Mechanics (IACM), the European Community on Computational Methods in Applied Sciences (ECCOMAS), The Chinese Society of Theoretical and Applied Mechanics, the China Civil Engineering Society, and the Architectural Society of China. A total of 10 invited papers, and around 140 contributed papers were presented in the proceedings of the symposium. Contributors of papers came from 20 countries around the world and covered a wide spectrum related to the computational structural engineering.

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