Forensic Structural Engineering Handbook

The Geotechnical Engineering Investigation Handbook provides the tools necessary for fusing geological characterization and investigation with critical analysis for obtaining engineering design criteria. This second edition updates this pioneering reference for the 21st century, including developments that have occurred in the twenty years since the first edition was published. Such as: Remote sensing satellite imagery • Global positioning systems (GPS) • Geophysical exploration • Core penetrometer testing • Earthquake studies • Digitizing of data recording and retrieval • Field and laboratory testing and instrumentation • Use of the Internet for data retrieval. The Geotechnical Engineering Investigation Handbook, Second Edition is a comprehensive guide to a complete investigation: study to predict geologic conditions, test-boring procedures, various geophysical methods and when each is appropriate, various methods to determine engineering properties of materials, both laboratory-based and in situ; and formulating design criteria based on the results of the analysis. The author relates personal experiences, emphasizing identification and description of the elements of the geologic environment, the data required for analysis and design of the engineering works, and procuring data. By using a practical approach to problem solving, this book helps engineers consider geological phenomena in terms of the degree of their hazard and the potential risk of their occurrence.

Manual of Geotechnical Laboratory Soil Testing

This second edition of Manual of Geotechnical Laboratory Soil Testing was written by a prominent soil science consultant and is meant to provide civil engineering students with a comprehensive guide to geotechnical soil testing. The book offers a clear and concise overview of the various aspects of soil testing, including the preparation of samples, laboratory testing techniques, and the interpretation of test results. It covers a wide range of topics, from basic soil properties to more advanced testing methods. The book is designed to be accessible to students with varying levels of experience, providing both introductory and advanced material to accommodate different learning needs.

Characteristics of Geologic Materials and Formations

Subsurface investigation is the most important phase of any civil engineering construction or development activities. The geologic conditions can be extremely complex, variable, and subject to change with time; soil test borings and in-situ tests are employed to obtain subsurface information. Resistivity Imaging (RI) is a non-destructive, fast and cost-effective method of site investigation and soil characterization. Site Investigation using Resistivity Imaging aims to summarize pertinent details of RI in site investigation for geotechnical and geo-environmental applications. It aims to bridge the gap that currently exists between the geotechnical/geo-environmental and geophysical community. The geotechnical and geo-environmental engineers will be able to assimilate geophysical data and design collaboration. First, a comprehensive handbook aimed at engineers that summarizes pertinent details of Resistivity Imaging (RI) in site investigation for geotechnical and geoenvironmental applications, for geotechnical and geoenvironmental engineers, making it possible to interpret geophysical data and utilize the information for their design, explaining the advantages of RI over other geophysical methods such as interferometric synthetic aperture radar and ground-penetrating radar. The book will cover subject areas including developments that have occurred in the twenty years since the first edition was published, such as: Remotely sensed satellite imagery, large coverage, low cost, quick and easy data processing.

Earthquake Geotechnical Engineering for Protection and Development of Environment and Constructions

The Geotechnical Engineering Handbook brings together essential information related to the evaluation of engineering properties of soils, design of foundations, retaining walls, and drainage systems, and fundamental principles of analyzing the stability of slopes and embankments, retaining walls, and other earth-retaining structures. The handbook also covers soil dynamics and foundation vibration to analyze the behavior of foundations subjected to cyclic vertical, sliding, and rocking excitations and topics addressed in some detail include: environmental geotechnology and foundations for railroad beds.

Forensic Geotechnical and Foundation Engineering, Second Edition

A complete, up-to-date guide for forensic engineers—fully revised and packed with current case studies. Forensic Geotechnical and Foundation Engineering, Second Edition provides a step-by-step approach to conducting a professional geotechnical and foundation investigation. This authoritative resource explains how to: Investigate damage, deterioration, and collapse in a structure Determine what caused the damage and how it occurred Investigate the history of the site and its geotechnology Prepare files and reports AVOID civil liability AVOID unpleasant charts and graphs AND you’re understanding of the material covered. The book also covers soil dynamics and foundation vibration to analyze the behavior of foundations subjected to cyclic vertical, sliding, and rocking excitations and topics addressed in some detail include: environmental geotechnology and foundations for railroad beds.

Site Investigation using Resistivity Imaging

In this edited volume on advances in forensic geotechnical engineering, a number of technical contributions by experts and professionals in this area are included. The work is the outcome of deliberations at various conferences in the area conducted by Prof. G.L. Sivakumar Babu and Dr. V.V.S. Rao as secretary and Chairman of Technical Committee on Forensic Geotechnical Engineering of International Society for Soil Mechanics and Geotechnical Engineering. This volume contains papers on topics such as: Guidelines for Failure Investigation: Guidelines for Forensic Engineering Practice: The scope of engineering seismology includes geotechnical site investigations for buildings and engineering infrastructures, such as dams, levees, bridges, and tunnels, landslide and active fault investigations, seismic microzonation, and geophysical investigations of historic buildings. These projects require multidisciplinary collaboration between the geologist, geophysicist, and geotechnical and earthquake engineer. A key objective of this book is to provide concise instructions in Geotechnical Series No. 175 by O.J. Yim and to encourage the specialists from these disciplines to apply the seismic method to solve the many challenging engineering problems they face. The broader scope of engineering seismology also includes exploration of earth resources, including groundwater exploration, coal and mineral exploration, and geothermal exploration. While focusing on the application of the seismic method to geotechnical geotechnical site investigations, this book includes many case...
Studies in all of the applications of engineering seismology.

Soil Properties and their Correlations

The main body of the first volume is taken up by five major keynote papers written by a team of international experts, that survey the enormous advances in geotechnical engineering since Skempton's pioneering early work. The second volume contains more than 80 articles that report recent research and advances in practice from around the world. The papers focus on the broad range of geotechnical issues, that most interested Professor Skempton, and are grouped under the headings of - Soil behaviour, characterisation and modelling - Foundations - Slopes and embankments - Ground performance - The influence of geology on civil engineering.

Geotechnical Engineering

This practical handbook of properties for soils and rock contains in a concise tabular format the key issues relevant to geotechnical investigations, assessments and designs in common practice. There are brief notes on the application of the tables. These data tables are compiled by experienced geotechnical professionals who require a reference document to access key information. There is an extensive database of correlations for different applications. The book should provide a useful bridge between soil and rock mechanics and its application to practical engineering solutions. The initial chapters deal with the planning of the geotechnical investigation and the classification of soils and rocks from which the more used testing is covered. Later chapters show the reliability and correlations that are used to convert this data in the interpretative and assessment phase of the project. The final chapters apply some of these concepts to geotechnical design. The emphasis throughout is on application to practice. This book is intended primarily for practicing geotechnical engineers working in investigation, assessment and design, but should provide a useful supplement for postgraduate courses. It evolved from the need to have a "go to" reference book which has both breadth and depth of information to apply immediately to projects. To keep in a handbook size one has to compromise restricts to a few key bullet points - but a comprehensive reference list provides the "appendices" for additional information if required. This 2nd edition keeps to that format but contains updated information and adjustments that take into account feedback received since initial publication.

Technology and Practice in Geotechnical Engineering

Geotechnical Engineering Investigation Handbook, Geotechnical Investigation Methods offers clear, concise guidance on soil and rock behaviour in practical engineering situations. It is a reference book for professionals who require a comprehensive, and practical approach to the assessment and interpretation of geotechnical results. It is designed to be a "go to" resource, and can be used as a textbook for graduates and postgraduates.

Soil liquefaction

Design practice in offshore geotechnical engineering has grown out of onshore practice, but the two application areas have tended to diverge over time as the scale of the foundation and anchoring elements used offshore, and partly by fundamental differences in construction and installation techniques. As a consequence offshore geotechnical engineering has grown as a specialty. The structure of Offshore Geotechnical Engineering follows a pattern that mimics the flow of a typical offshore project. In the early chapters it provides a broad overview of the marine environment, offshore site investigation techniques and interpretation of soil behaviour. It proceeds to cover geotechnical design of piled foundations, shallow foundations and anchoring systems. Three topics are then covered which require a more multi-disciplinary approach: the design of mobile drilling rigs, pipelines and geohazards. This book serves as a framework for undergraduate and postgraduate courses, and will appeal to professional engineers specialising in the offshore industry.

Geotechnical Engineering of Dams

The investigation phase is the most important segment of any geotechnical study. Using the correct methods and properly interpreting the results are critical to a successful investigation. Comprising chapters from the second edition of the revered Geotechnical Engineering Investigation Handbook, Geotechnical Investigation Methods offers clear, concise guidance on soil and rock behaviour in practical engineering situations. It is a reference book for professionals who require a comprehensive, and practical approach to the assessment and interpretation of geotechnical results. It is designed to be a "go to" resource, and can be used as a textbook for graduates and postgraduates.

Finite Element analysis in Geotechnical Engineering

Earthquake Geotechnical Engineering for Protection and Development of Environment and Constructions contains invited, keynote and lecture and regular papers presented at the 7th International Conference on Geotechnical Geotechnical Engineering (Rome, Italy, 17-20 June 2009) on the last advances and 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 paper section - 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, from practitioners, geologists and technologists, consultants, public and private contractors, local national and international authorities, and to all those involved in research and practice related to Earthquake Geotechnical Engineering.
Advances in Geotechnical Engineering

The Most Complete and Up-to-Date Resource on Forensic Structural Engineering Thoroughly revised and featuring contributions from leading experts, this definitive handbook offers comprehensive treatment of forensic structural engineering and expert witness delivery. From exploring the possible origins of errors, through investigating and analyzing failures, to working with the legal profession for assigning responsibility, Forensic Structural Engineering Handbook, Second Edition covers every important topic in the field. The design and construction process, design and construction safety codes, standards, and regulations, standard of care and duty to perform, first steps and legal concerns after a failure, engineering investigation of failures, origins and causes of failure, lost and hazards, design errors, construction defects, and property damage, foundation defect, foundation settlement, building envelope, and structural foundations litigation and dispute resolution.

Geotechnical Engineering Design

An essential guide to improving preliminary geotechnical analysis and design from limited data. Soil Properties and their Correlations, Second Edition provides a summary of commonly used soil engineering properties and gives a wide range of correlations between the various properties, presented in the context of how they will be used in geotechnical design. The book is divided into 11 chapters: Commonly Measured Properties, Grading and Density, Permeability, Consolidation and Settlement, Shear Strength, California Bearing Ratio, Shrinkage and Swelling Characteristics, Frost Susceptibility, Susceptibility to combustion, and Soil-structure interfaces. In addition, there are two appendices: Soil classification systems, and Sampling methods. This new, more comprehensive, edition provides material that would be of practical assistance to those faced with the problem of having to estimate soil behavior from little or no laboratory test data. Key features: Soil properties explained in practical terms. A large number of correlations between different soil properties. A valuable aid for assessing design values at different depths. Clear statements on practical limitations and accuracy. An invaluable source of reference for experienced professionals working on geotechnical design. It will also give students and early-career engineers an in-depth appreciation of the appropriate use of each property and the pitfalls to avoid.

Geotechnical Earthquake Engineering, Second Edition

An insight into the use of the finite element method in geotechnical engineering. The first volume covers the theory and the second volume covers the applications of the subject. The work examines popular constitutive models, numerical techniques and case studies.

Geotechnical and Foundation Engineering

With the encroachment of the Internet into nearly all aspects of work and life, it seems as though information is everywhere. However, there is information and then there is correct, appropriate, and timely information. While we might love being able to turn to Wikipedia for encyclopeda-like information or search Google for the thousands of links on a topic, engineers need the best information, information that is evaluated and vetted. Vetted information is necessary when building new skyscrapers or developing new prosthetics for returning military veterans. While the award-winning first edition of Using the Engineering Literature used a roadmap analogy, we now need a three-dimensional approach reflecting the complex and dynamic nature of research in the information age. Using the Engineering Literature, Second Edition presents a guide to the wide range of resources available in all fields of engineering. This second edition has been thoroughly revised and features new sections on nanotechnology as well as green engineering. The information age has greatly impacted the way engineers find information. Engineers have an effect, directly and indirectly, on almost all aspects of our lives, and it is vital that they find the right information at the right time to create better products and processes. Comprehensive and up-to-date, with expert chapters, this book fills a gap in the literature, providing critical information in a user-friendly format.

Geological and Geotechnical Engineering in the New Millennium

This book outlines the fundamental steps that will assist forensic engineers in tailoring their forensic investigations of failures and performance problems associated with structures and building systems.

Offshore Geotechnical Engineering

Designed to give engineers a crash course in all aspects of modern geotechnical and foundation engineering. Takes readers step-by-step through the typical process of a design project—from proposal writing to the final preparation of the “as built” report. Includes numerous visual aids: photographs, charts, tables, and more than 350 illustrations.

Geotechnical Engineering Handbook

Soil liquefaction is a major concern in areas of the world subject to seismic activity or other repeated vibration loads. This book brings together a large body of information on the topic, and presents it within a unified and simple framework. The result is a book which will provide the practising civil engineer with a very sound understanding of the subject. The work examines popular constitutive models, numerical techniques and case studies.

Geotechnical Engineering Calculations and Rules of Thumb

Geotechnical Engineering Calculations Manual offers geotechnical, civil and structural engineers a concise, easy-to-understand approach to the formulas and calculation methods used in soil and geotechnical engineering. A one-stop guide to the foundation design, pile foundation design, and embankment design. It also includes techniques and computer software, this book places calculations for almost all aspects of geotechnical engineering at your finger tips. In this book, theories are explained in a nutshell and then the calculation is presented and solved in an illustrated, step-by-step fashion. All calculations are provided in both fps and SI units. The manual includes topics such as shallow foundations, deep foundations, earth retaining structures, rock mechanics and tunnelling, and it includes all the heavy-number-crunching for you, so you get instant, ready-to-apply data on activities such as hard ground tunnelling, soft ground tunnelling, reinforced earth retaining walls, geotechnical aspects of wetland mitigation and geotechnical aspects of landfill design. It is an invaluable source of reference for experienced professionals working on geotechnical design. It will also give students and early-career engineers an in-depth appreciation of the appropriate use of each property and the pitfalls to avoid.

Bridge Engineering Handbook, Second Edition

This one-stop resource—filled with in-depth earthquake engineering analysis, testing procedures, seismic and construction codes—features new coverage of the 2012 International Building Code.

Handbook of Geotechnical Investigation and Design Tables

This comprehensive reference provides the tools necessary for fusing geological characterization and investigation with critical analysis for obtaining engineering design criteria. The second edition updates this pioneering reference for the 21st century.
including developments that have occurred in the twenty years since the first edition was published, such as: • Remotely sensed satellite images • Ground penetrating radar • Geophysical exploration • Cone penetrometer testing • Earthquake studies • Digitalizing of data recording and retrieval • Field and laboratory testing and instrumentation • Use of the Internet for data retrieval. The Geotechnical Engineering Investigation Handbook, Second Edition is a comprehensive guide to complete investigations: study to predict geologic conditions and use of exploratory methods and when each is appropriate; various methods to determine engineering properties of materials, both laboratory-based and in situ; and formulating design criteria based on the results of the analysis. The author relies on his 50+ years of professional experience, emphasizing identification and description of the elements of the geologic environment, the data needed for engineering works, and assessing the data. By using a practical approach to problem solving, this book helps engineers consider geological phenomena in terms of the degree of their hazard and the potential risk of their occurrence.

An Introduction to Geotechnical Engineering

Properly understanding and characterizing geologic materials and formations is vital for making critical engineering decisions. Identifying and classifying rock masses and soil formations allows reasonable estimation of their characteristic properties. This book provides a basis for the engineer to understand and classify the various rock and soil types. With clear, concise, and hands-on guidance, this book describes rock and soil types in terms of their origin, mode of occurrence, and structural features in situ and presents the typical characteristics that are of engineering significance. It also explains the elements that affect surface and subsurface water engineering projects: hydrologic, hydraulic, subsurface, flow, and seepage, as well as for water conservation. By using important correlations used to estimate engineering and geologic properties, the book presents correlations for intact rock, rock masses, and soil formations throughout the chapters and condenses this information into a convenient summary table in an appendix. Eliminate the need to search through narrow volumes or large handbooks with Characteristics of Geologic Materials and Formations: A Field Guide for Geotechnical Engineers, a convenient and complete guide to the techniques you need.

Geotechnical Engineering Investigation Handbook, Second Edition

Engineers geologists, architects, planners, and construction managers can quickly find information they must refer to every working day, in one volume library of instant geotechnical and foundation data. Now for the first time ever, geotechnical, foundation, and civil engineering works, and procuring the data. By using a practical approach to problem solving, this book helps engineers consider geological phenomena in terms of the degree of their hazard and the potential risk of their occurrence.
For stress distribution, pavement, and pipeline design. You also get abundant information on all types of geotechnical analyses, including settlement, bearing capacity, expansive soil, slope stability - plus coverage of retaining walls and building foundations. Other construction-related topics covered include grading, instrumentation, excavation, underpinning, groundwater control and more.

Forensic Geotechnical Engineering

A manual of Geotechnical Laboratory Soil Testing covers physical, index, and engineering properties of soils, including compaction characteristics (optimum moisture content), permeability (coefficient of hydraulic conductivity), compressibility characteristics, and shear strength (cohesion intercept and angle of internal friction). Further, this manual covers data collection, analysis, computations, additional considerations, sources of error, precautionary measures, and the presentation results along with well-defined illustrations for each of the listed tests. Each test is based on relevant standards with pertinent references, broadly aimed at geotechnical design applications. FEATURES Provides fundamental coverage of elementary-level laboratory characterization of soils Describes objectives, basic concepts, general understanding, and appreciation of the geotechnical principles for determination of physical, index, and engineering properties for soils. Presents the step-by-step procedures for various tests based on relevant standards. Interprets test results and data and illustrates the relationship between various soil properties. Includes observation data sheet and analysis, results and discussions, and applications of test results. This manual is aimed at undergraduates, senior undergraduates, and researchers in geotechnical and civil engineering. Prof. (Dr.) Bashir Ahmed Mir is among the senior faculty of the Civil Engineering Department of the National Institute of Technology Srinagar and has more than two decades of teaching experience. Prof. Mir has published more than 100 research papers in international journals and conferences, chaired technical sessions in international conferences in India and throughout the world, and provided consultancy services to more than 150 projects of national importance to various government and private agencies.

Using the Engineering Literature, Second Edition