Geotechnical Engineering Formulas | 9983218829bde1910338785659a913c8

Specifications for Highway BridgesSoil Mechanics in Engineering PracticeAdvances in Rock-Support and Geotechnical EngineeringGeotechnical Engineering BundleWörterbuch GeoTechnik/Dictionary Geotechnical EngineeringGeotechnical EngineeringGeotechnical Engineering Calculations and Rules of ThumbGeotechnical Engineering in the XXI Century: Lessons learned and future challengesGeotechnical EngineeringGeotechnical EngineeringJournal of the Geotechnical Engineering DivisionFinite Element Analysis in Geotechnical EngineeringPractical Soil DynamicsGeotechnical Engineer's Portable HandbookPrinciples of Foundation EngineeringNumerical Methods in Geotechnical EngineeringGeotechnical Engineering for Disaster Mitigation and RehabilitationFoundation Analysis and DesignIntroductory Geotechnical EngineeringGeotechnical Engineering Calculations and Rules of ThumbGeotechnical EngineeringIrrigation Pocket Book; Or, Facts, Figures, and Formulæ, for Irrigation EngineersFundamentals of Geotechnical EngineeringBasics of Foundation DesignGeotechnical EngineeringBearing Capacity of SoilsProceedings of China-Europe Conference on Geotechnical EngineeringGeotechnical Investigation MethodsPractice of Optimisation Theory in Geotechnical EngineeringGeotechnical Engineering-a Short Practice Book for RPSC-AE (Mains)In Situ Tests in Geotechnical EngineeringCivil Engineering FormulasTransportation Highway Engineering Calculations and Rules of ThumbJournal of Geotechnical EngineeringGeotechnical Engineering Calculations and Rules of ThumbGeotechnical Engineering Education and TrainingEffective Stress and Equilibrium Equation for Soil MechanicsFormulae, Charts and Tables in the Area of Soil Mechanics and Foundation EngineeringIntroduction to Geotechnical EngineeringGeotechnical Engineering Handbook

Advances in Rock-Support and Geotechnical Engineering brings together the latest research results regarding the theory of rock mechanics, its analytical methods and innovative technologies, and its applications in practical engineering. This book is divided into six sections, rock tests, rock bolting, grouted anchor, tunneling engineering, slope engineering, and mining engineering. Coverage includes fracture hinged arching process and instability characteristics of rock plates, failure modes of rock bolting, scale effects, and loading transfer mechanism of the grouted anchor. Also covered are recent innovations and applications in tunneling engineering, slope engineering, and mining engineering. This book provides innovative, practical, and rich content that can be used as a valuable reference for researchers undertaking tunneling engineering, slope engineering, mining engineering, and rock mechanics, and for onsite technical personnel and teachers and students studying the topics in related universities. Enriches new theories on failure modes of rock plates, rock bolting mechanisms, and anchor loading transfer Develops new methods of evaluating the stability of slope engineering and the roof stability of the mined-out areas Includes fracture hinged arching process and instability characteristics of rock plates, failure modes of rock bolting, scale effects, and loading transfer mechanism of the grouted anchor

"Geotechnical Engineering for Disaster Mitigation and Rehabilitation" presents the latest developments and case studies in the field. All contributions to this proceedings were rigorously reviewed to cover the newest developments in disasters related to earthquakes, landslides and slopes, soil dynamics, risk assessment and management, disaster mitigation and rehabilitation, and others. The book will be a useful reference for geotechnical scientists, engineers and professionals in these areas.

The purpose of this manual is to provide guidelines for calculation of the bearing capacity of soil under shallow and deep foundations supporting various types of structures and embankments. This manual is intended as a guide for determining allowable and ultimate bearing capacity. It is not intended to replace the judgment of the design engineer on a particular project. Principles for evaluating bearing capacity presented in this manual are applicable to numerous types of structures such as buildings and houses, towers and storage tanks, fills, embankments and dams. These guidelines may be helpful in determining soils that will lead to bearing capacity failure or excessive settlements for given foundations and loads.

This book deals with in-situ tests that are performed in geotechnics to identify and characterize the soil. These measurements are then used to size the Civil Engineering works This book is intended for engineers, students and geotechnical researchers. It provides useful information for use and optimal use of in-situ tests to achieve a better book adaptation of civil engineering on the ground

Numerical Methods in Geotechnical Engineering contains 153 scientific papers presented at the 7th European Conference on Numerical Methods in Geotechnical Engineering, NUMGE 2010, held at Norwegian University of Science and Technology (NTNU) in Trondheim, Norway, 2 4 June 2010.The contributions cover topics from emerging research to engineering pra

This book constitutes the definitive handbook to soil mechanics, covering in great detail such topics as: Properties of Soils, Hydraulic and Mechanical Properties of Soils, Drainage of Soils, Plastic Equilibrium in Soils, Earth Stability and Pressure of Slopes, Foundations, etc. A valuable compendium for those interested in soil mechanics, this antiquarian text contains a

wealth of information still very much valuable to engineers today. Karl von Terzaghi (1883 1963) was a Czech geologist and Civil engineer, hailed as the "father of soil mechanics." This book has been elected for republication due to its educational value and is proudly republished here with an introductory biography of the author."

The "Red Book" presents a background to conventional foundation analysis and design. The text is not intended to replace the much more comprehensive 'standard' textbooks, but rather to support and augment these in a few important areas, supplying methods applicable to practical cases handled daily by practising engineers and providing the basic soil mechanics background to those methods. It concentrates on the static design for stationary foundation conditions. Although the topic is far from exhaustively treated, it does intend to present most of the basic material needed for a practising engineer involved in routine geotechnical design, as well as provide the tools for an engineering student to approach and solve common geotechnical design problems.

Combining a brand new reference and a must-have title, this bundle will help you get up to speed with calculations for solving complex engineering problems. Geotechnical Engineering Calculations and Rules of Thumb is a one-stop guide to the formulas and calculation methods used in soil and geotechnical engineering. With ready-to-apply data, it is a time saver placing calculations for almost all aspects of geotechnical engineering at your fingertips. Engineering with MathCAD demonstrates the power of MathCAD to create calculations for solving engineering problems. With examples from a wide range of engineering fields and with a step-by-step approach, it is an invaluable resource for students and professionals alike. Save time, effort and money with this great value bundle that contains guidance that will help you solve engineering problems more efficiently.

FUNDAMENTALS OF GEOTECHNICAL ENGINEERING, 5E offers a powerful combination of essential components from Braja Das' market-leading books: PRINCIPLES OF GEOTECHNICAL ENGINEERING and PRINCIPLES OF FOUNDATION ENGINEERING in one cohesive book. This unique, concise geotechnical engineering book focuses on the fundamental concepts of both soil mechanics and foundation engineering without the distraction of excessive details or cumbersome alternatives. A wealth of worked-out, step-by-step examples and valuable figures help readers master key concepts and strengthen essential problem solving skills. Prestigious authors Das and Sivakugan maintain the careful balance of today's most current research and practical field applications in a proven approach that has made Das' books leaders in the field. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

Transportation and Highway Engineering Calculations and Rules of Thumb: Theory and Practice and Design Examples provides a step-by-step view of the calculations, formulas, and equations applied to everyday highway design and construction operations including calculations involving geotechnical problems, seismic issues, and structural design. Features easy to read and understand tables, schematics, and calculations Provides examples with step-by-step calculations in both in US and SI metric units Provides users with an illustrated easy-to-understand approach to highway engineering equations and calculation methods Covers geotechnical and seismic considerations

The Geotechnical Engineering Handbook brings together essential information related to the evaluation of engineering properties of soils, design of foundations such as spread footings, mat foundations, piles, and drilled shafts, 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.

Geotechnical Engineering Calculations and Rules of Thumb, Second Edition, offers geotechnical, civil and structural engineers a concise, easy-to-understand approach to selecting the right formula and solving even most difficult calculations in geotechnical engineering. A "quick look up guide", this book places formulas and calculations at the reader's 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. In its first part, the book covers the fundamentals of Geotechnical Engineering: Soil investigation, condition and theoretical concepts. In the second part it addresses Shallow Foundations, including bearing capacity, elastic settlement, foundation reinforcement, grillage design, footings, geogrids, tie and grade beams, and drainage. This session ends with a chapter on selecting foundation types. The next part covers Earth Retaining Structures and contains chapters on its basic concepts and types, gabion walls and reinforced earth walls. The following part covers Geotechnical Engineering Strategies providing coverage of softwares, instrumentation, excavations, raft design, rock mechanics, dip angle and strike, rock stabilization equipment, soil anchors, tunnel design, seismology, geosynthetics, and slurry cutoff walls. The final part is on Pile Foundations including content on design on sandy soils, clay soils, pin piles, negative skin friction, caissons and pile clusters. In this new and updated edition the author has incorporated new software calculation tools, current techniques for foundation design, liquefaction information, seismic studies, laboratory soil tests, geophysical techniques, new concepts for foundation design and Dam designs. All calculations have been updated to most current material characteristics available in

the market. Practicing Geotechnical, Civil and Structural Engineers may find in this book an excellent companion to their day-to day work, benefiting from the clear and direct calculations, examples, and cases. Civil Engineering students may find particular interest in the concise theory presented in the beginning of each chapter. Calculations both in FPS and SI metric systems; Convenient access to all needed calculations; Access to concise theory that helps understand the calculations; Case studies from around the world; Includes new software calculation tools.

"The main objective of this book is to provide a comprehensive pile design and construction guide to practising geotechnical engineers. The book does not require any special technical knowledge other than basic mathematical skills. The first portion deals with construction aspects of piling. In this section, pile types, pile hammers, piling techniques, problems associated with piling work and cost considerations are discussed. Second portion of the book is devoted to pile design. Pile design in different soil conditions, pile groups, pile settlement, Bitumen coated pile design and lateral loading analysis were some of the subjects discussed. Almost all the chapters in the design section contain design examples. Design examples are provided to complement the theory and the designer should not follow the examples blindly during the design process"--Bookjacket.

The revision of this best-selling text for a junior/senior course in Foundation Analysis and Design now includes an IBM computer disk containing 16 compiled programs together with the data sets used to produce the output sheets, as well as new material on sloping ground, pile and pile group analysis, and procedures for an improved anlysis of lateral piles. Bearing capacity analysis has been substantially revised for footings with horizontal as well as vertical loads. Footing design for overturning now incorporates the use of the same uniform linear pressure concept used in ascertaining the bearing capacity. Increased emphasis is placed on geotextiles for retaining walls and soil nailing.

A gathering of useful data in tabular/chart form with examples to demonstrate the use of the information. No indices. Annotation copyright Book News, Inc. Portland, Or.

A must have reference for any engineer involved with foundations, piers, and retaining walls, this remarkably comprehensive volume illustrates soil characteristic concepts with examples that detail a wealth of practical considerations, It covers the latest developments in the design of drilled pier foundations and mechanically stabilized earth retaining wall and explores a pioneering approach for predicting the nonlinear behavior of laterally loaded long vertical and batter piles. As complete and authoritative as any volume on the subject, it discusses soil formation, index properties, and classification; soil permeability, seepage, and the effect of water on stress conditions; stresses due to surface loads; soil compressibility and consolidation; and shear strength characteristics of soils. While this book is a valuable teaching text for advanced students, it is one that the practicing engineer will continually be taking off the shelf long after school lets out. Just the quick reference it affords to a huge range of tests and the appendices filled with essential data, makes it an essential addition to an civil engineering library.

An insight into the use of the finite 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.

This book discusses contemporary issues related to soil mechanics and foundation engineering in earthworks, which are critical components in construction projects and often require detailed management techniques and unique solutions to address failures and implement remedial measures. The geotechnical engineering community continues to improve the classical testing techniques for measuring critical properties of soils and rocks, including stress wave-based non-destructive testing methods as well as methods used to improve shallow and deep foundation design. To minimize failure during construction, contemporary issues and related data may reveal useful lessons to improve project management and minimize economic losses. This book focuses on these aspects using appropriate methods in a rather simple manner. It also touches upon many interesting topics in soil mechanics and modern geotechnical engineering practice such as geotechnical earthquake engineering, principals in foundation design, slope stability analysis, modeling in geomechanics, offshore geotechnics, and geotechnical engineering perspective in the preservation of historical buildings and archeological sites. A total of seven chapters are included in the book.

Geotechnical Engineering Calculations Manual offers geotechnical, civil and structural engineers a concise, easy-to-understand approach the formulas and calculation methods used in of soil and geotechnical engineering. A one stop guide to the foundation design, pile foundation design, earth retaining structures, soil stabilization techniques and computer software, this book places calculations for almost all aspects of geotechnical engineering at your finger tips. In this book, theories is 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. In this book, the author's done 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. • Easy-to-understand

approach the formulas and calculations • Covers calculations for foundation,earthworks and/or pavement subgrades • Provides common codes for working with computer software • All calculations are provided in both US and SI units

Die zweite überarbeitete und erweiterte Auflage des Bandes Deutsch/Englisch des Wörterbuchs GeoTechnik enthält jetzt etwa 70.000 Eintragungen. Zu jedem Stichwort werden gebräuchliche Synonyme aufgeführt. Zum besseren Verständnis finden sich unter einigen Stichwörtern zusätzliche Erläuterungen. Neben Begriffen aus der allgemeinen Geologie deckt das Wörterbuch insbesondere die eher anwendungsorientierten Themenbereiche der Geowissenschaften ab. Schwerpunktmäßig werden folgende Gebiete behandelt: - Bergbau, - Bodenkunde, - Erdbau, - Hangbewegungen - Erkundungsgeologie, - Fernerkundung, - Geophysik, - Geomorphologie, - Geodäsie, - Umweltgeotechnik - Grundbau, - Hydrogeologie, - Hydrotechnik, - Ingenieurgeologie, - Kartographie, - Fotogrammetrie - Lagerstättenkunde, - Mineralogie, - Ozeanografie,- Vermessungswesen, - Fels- und Tunnelbau, - Deichbau, - Verkehrswegebau. .

Geotechnical Engineering Calculations and Rules of Thumb, Second Edition, offers geotechnical, civil and structural engineers a concise, easy-to-understand approach to selecting the right formula and solving even most difficult calculations in geotechnical engineering. A "quick look up guide", this book places formulas and calculations at the reader's 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. In its first part, the book covers the fundamentals of Geotechnical Engineering: Soil investigation, condition and theoretical concepts. In the second part it addresses Shallow Foundations, including bearing capacity, elastic settlement, foundation reinforcement, grillage design, footings, geogrids, tie and grade beams, and drainage. This session ends with a chapter on selecting foundation types. The next part covers Earth Retaining Structures and contains chapters on its basic concepts and types, gabion walls and reinforced earth walls. The following part covers Geotechnical Engineering Strategies providing coverage of softwares, instrumentation, excavations, raft design, rock mechanics, dip angle and strike, rock stabilization equipment, soil anchors, tunnel design, seismology, geosynthetics, and slurry cutoff walls. The final part is on Pile Foundations including content on design on sandy soils, clay soils, pin piles, negative skin friction, caissons and pile clusters. In this new and updated edition the author has incorporated new software calculation tools, current techniques for foundation design, liquefaction information, seismic studies, laboratory soil tests, geophysical techniques, new concepts for foundation design and Dam designs. All calculations have been updated to most current material characteristics available in the market. Practicing Geotechnical, Civil and Structural Engineers may find in this book an excellent companion to their day-to day work, benefiting from the clear and direct calculations, examples, and cases. Civil Engineering students may find particular interest in the concise theory presented in the beginning of each chapter. Calculations both in FPS and SI metric systems; Convenient access to all needed calculations; Access to concise theory that helps understand the calculations; Case studies from around the world; Includes new software calculation tools.

Instant Access to Civil Engineering Formulas Fully updated and packed with more than 500 new formulas, this book offers a single compilation of all essential civil engineering formulas and equations in one easy-to-use reference. Practical, accurate data is presented in USCS and SI units for maximum convenience. Follow the calculation procedures inside Civil Engineering Formulas, Second Edition, and get precise results with minimum time and effort. Each chapter is a quick reference to a well-defined topic, including: Beams and girders Columns Piles and piling Concrete structures Timber engineering Surveying Soils and earthwork Building structures Bridges and suspension cables Highways and roads Hydraulics, drams, and waterworks Power-generation wind turbines Stormwater Wastewater treatment Reinforced concrete Green buildings Environmental protection

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, conc

This book presents the development of an optimization platform for geotechnical engineering, which is one of the key components in smart geotechnics. The book discusses the fundamentals of the optimization algorithm with constitutive models of soils. Helping readers easily understand the optimization algorithm applied in geotechnical engineering, this book first introduces the methodology of the optimization-based parameter identification, and then elaborates the principle of three newly developed efficient optimization algorithms, followed by the ideas of a variety of laboratory tests and formulations of constitutive models. Moving on to the application of optimization methods in geotechnical engineering, this book presents an optimization-based parameter identification platform with a practical and concise interface based on the above theories. The book is intended for undergraduate and graduate-level teaching in soil mechanics and geotechnical engineering and other related engineering specialties. It is also of use to industry practitioners, due to the inclusion of real-world applications, opening the door to advanced courses on both modeling and algorithm development within the industrial engineering and operations research fields.

Integrating and blending traditional theory with particle-energy-field theory, this book provides a framework for the analysis

of soil behaviour under varied environmental conditions. This book explains the why and how of geotechnical engineering in an environmental context. Using both SI and Imperial units, the authors cover: rock mechanics soil mechanics and hydrogeology soil properties and classifications and issues relating to contaminated land. Students of civil, geotechnical and environmental engineering and practitioners unfamiliar with the particle-energy-field concept, will find that this book's novel approach helps to clarify the complex theory behind geotechnics.

In this book,a chapter on stability of slopes has been included as most of the universities cover this in the first course of Geotechnical Engineering.The contents of this volume are written at a basic level suitable for a first course inGeotechnical Engineering.This book highlights the basic principles of soil mechnics along with applications to many problems in Geotechnical Engineering.The material is covered in a very simple,clear and logical manner.A number of solved and exercise problems have been included in each chapter.

The first Pan-American Conference on Soil Mechanics and Geotechnical Engineering (PCSMGE) was held in Mexico in 1959. Every 4 years since then, PCSMGE has brought together the geotechnical engineering community from all over the world to discuss the problems, solutions and future challenges facing this engineering sector. Sixty years after the first conference, the 2019 edition returns to Mexico. This book, Geotechnical Engineering in the XXI Century: Lessons learned and future challenges, presents the proceedings of the XVI Pan-American Conference on Soil Mechanics and Geotechnical Engineering (XVI PCSMGE), held in Cancun, Mexico, from 17 – 20 November 2019. Of the 393 full papers submitted, 335 were accepted for publication after peer review. They are included here organized into 19 technical sessions, and cover a wide range of themes related to geotechnical engineering in the 21st century. Topics covered include: laboratory and in-situ testing; analytical and physical modeling in geotechnics; numerical modeling in geotechnics; unsaturated soils; soft soils; foundations and retaining structures; excavations and tunnels; offshore geotechnics; transportation in geotechnics; natural hazards; embankments and tailings dams; soils dynamics and earthquake engineering; ground improvement; sustainability and geo-environment; preservation of historic sites; forensics engineering; rock mechanics; education; and energy geotechnics. Providing a state-of-the-art overview of research into innovative and challenging applications in the field, the book will be of interest to all those working in soil mechanics and geotechnical engineering. In this proceedings, 58% of the contributions are in English, and 42% of the contributions are in Spanish or Portuguese.

The objective of this book is to fill some of the gaps in the existing engineering codes and standards related to soil dynamics, concerning issues in earthquake engineering and ground vibrations, by using formulas and hand calculators. The usefulness and accuracy of the simple analyses are demonstrated by their implementation to the case histories available in the literature. Ideally, the users of the volume will be able to comment on the analyses as well as provide more case histories of simple considerations by publishing their results in a number of international journals and conferences. The ultimate aim is to extend the existing codes and standards by adding new widely accepted analyses in engineering practice. The following topics have been considered in this volume: • main ground motion sources and properties • typical ground motions, recording, ground investigations and testing • soil properties used in simple analyses • fast sliding in non-liquefied soil • flow of liquefied sandy soil • massive retaining walls • slender retaining walls • shallow foundations • piled foundations • tunnels, vertical shafts and pipelines • ground vibration caused by industry. Audience: This book is of interest to geotechnical engineers, engineering geologists, earthquake engineers and students

This Book of Geotechnical Engineering is designed topic-wise for Civil Engineering students those are preparing RPSC-AE (Mains). The book contain Practice Questions based on actual pattern of RPSC. Questions are classified in three sections, viz. 2 marks, 5 marks and 20 marks weightage. A summary of formula and equations are also provided at the last of each chapter. The book contains each and every topic those have possibility to come in exam. Due to its proper presentation and quality of questions, this book is absolutely different from the routine books available in the market

Geotechnical Properties of Soil - Natural Soil Deposits and Subsoil Exploration - Shallow Foundations: Ultimate Bearing Capacity - Ultimate Bearing Capacity of Shallow Foundations: Special Cases - Shallow Foundations: Allowable Bearing Capacity and Settlement - Mat Foundations - Lateral Earth Pressure - Retaining Walls - Sheet Pile Walls - Braced Cuts - Pile Foundations - Drilled-Shaft Foundations - Foundations on Difficult Soils - Soil Improvement and Ground Modification.

This volume contains papers and reports from the Conference held in Romania, June 2000. The book covers many topics, for example, place, role and content of geotechnical engineering in civil, environmental and earthquake engineering.

Geotechnical Engineering: A Practical Problem Solving Approach covers all of the major geotechnical topics in the simplest possible way adopting a hands-on approach with a very strong practical bias. You will learn the material through worked examples that are representative of realistic field situations whereby geotechnical engineering principles are applied to solve real-life problems.

Written in a concise, easy-to understand manner, INTRODUCTION TO GEOTECHNICAL ENGINEERING, 2e, presents

intensive research and observation in the field and lab that have improved the science of foundation design. Now providing both U.S. and SI units, this non-calculus-based text is designed for courses in civil engineering technology programs where soil mechanics and foundation engineering are combined into one course. It is also a useful reference tool for civil engineering practitioners. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

One-volume library of instant geotechnical and foundation data Now for the first time ever, geotechnical, foundation, and civil engineersgeologistsarchitects, planners, and construction managers can quickly find information they must refer to every working day, in one compact source. Edited by Robert W. Day, the time -and effort-saving Geotechnical Engineer's Portable Handbook gives you field exploration guidelines and lab procedures. You'll find soil and rock classification, basic phase relationships, and all the tables and charts you need 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.

The concept of effective stress and the effective stress equation is fundamental for establishing the theory of strength and the relationship of stress and strain in soil mechanics and poromechanics. However, up till now, the physical meaning of effective stress has not been explained clearly, and the theoretical basis of the effective stress equation has not been proposed. Researchers have not yet reached a common understanding of the feasibility of the concept of effective stress and effective stress equation for unsaturated soils. Effective Stress and Equilibrium Equation for Soil Mechanics discusses the definition of the soil skeleton at first and clarifies that the soil skeleton should include a fraction of pore water. When a free body of soil skeleton is taken to conduct internal force analysis, the stress on the surface of the free body has two parts: one is induced by pore fluid pressure that only includes normal stress; the other is produced by all the other external forces excluding pore fluid pressure. If the effective stress is defined as the soil skeleton stress due to all the external forces excluding pore fluid pressure, the effective stress equation can be easily obtained by the internal force equilibrium analysis. This equation reflects the relationship between the effective stress, total stress and pore fluid pressure, which does not change with the soil property. The effective stress equation of saturated soils and unsaturated soils is unified, i.e., o ?=o ?t –Seuw–(1–Se)ua. For multiphase porous medium, o ?=o ?t –u*,u*=Seiui(i=1,2,,M). In this book, a theoretical formula of the coefficient of permeability for unsaturated soils is derived. The formula of the seepage force is modified based on the equilibrium differential equation of the pore water. The relationship between the effective stress and the shear strength and deformation of unsaturated soils is preliminarily verified. Finally, some possibly controversial problems are discussed to provide a better understanding of the role of the equilibrium equation and the concept of effective stress.

This book compiles the first part of contributions to the China–Europe Conference on Geotechnical Engineering held 13.-16. August 2016 in Vienna, Austria. About 400 papers from 35 countries cover virtually all areas of geotechnical engineering and make this conference a truly international event. The contributions are grouped into thirteen special sessions and provide an overview of the geoengineering research and practice in China, Europe and the world: · Constitutive model · Micro-macro relationship · Numerical simulation · Laboratory testing · Geotechnical monitoring, instrumentation and field test · Foundation engineering · Underground construction · Environmental geotechnics · New geomaterials and ground improvement · Cold regions geotechnical engineering · Geohazards – risk assessment, mitigation and prevention · Unsaturated soils and energy geotechnics · Geotechnics in transportation, structural and hydraulic Engineering

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