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Nota di contenuto	Unsaturated Soil Mechanics in Engineering Practice; Contents; Foreword; Preface; Acknowledgments; Chapter 1 Theory to Practice of Unsaturated Soil Mechanics; 1.1 Introduction; 1.1.1 Application of Unsaturated Soil Mechanics in Engineering Practice; 1.1.2 Scope of the Book; 1.1.3 Gradual Emergence of Unsaturated Soil Mechanics; 1.1.4 Challenges to Implementation; 1.1.5 Laboratory and Field Visualization of Degree of Saturation; 1.2 Moisture and Thermal Flux Boundary Conditions; 1.2.1 Quantification of Moisture and Thermal Boundary Fluxes; 1.3 Determination of Unsaturated Soil Properties 1.3.1 Estimation Procedures for Unsaturated Soil Properties1.3.2 Design Protocols for Unsaturated Soil Properties; 1.4 Stages in Moving Toward Implementation; 1.4.1 State Variable Stage; 1.4.2 Constitutive Stage; 1.4.3 Formulation Stage; 1.4.4 Solution Stage; 1.4.5 Design Stage; 1.4.6 Verification and Monitoring Stage; 1.4.7 Implementation

Stage; 1.5 Need for Unsaturated Soil Mechanics; 1.5.1 Application Areas for Unsaturated Soil Mechanics; 1.5.2 Construction and Operation of a Dam; 1.5.3 Natural Slopes Subjected to Environmental Changes; 1.5.4 Mounding Below Waste Retention Ponds
1.5.5 Stability of Vertical or Near-Vertical Excavations
1.5.6 Bearing Capacity for Shallow Foundations; 1.5.7 Ground Movements Involving Expansive Soils; 1.5.8 Design of Soil Cover Systems and Capillary Breaks; 1.5.9 Road and Railroad Structures; 1.5.10 Characteristics of Unsaturated Soil Examples; 1.6 Partial Differential Equations in Soil Mechanics; 1.6.1 Components of Boundary Value Problem; 1.6.2 Partial Differential Equation Solving; 1.6.3 Convergence of Nonlinear Partial Differential Equations; 1.6.4 Uncoupled Processes in Unsaturated Soil Mechanics
1.6.5 Numerical Modeling of Saturated-Unsaturated Soils
1.6.6 Example of Two-Dimensional Seepage Analysis; 1.6.7 Finite Element Mesh for Three-Dimensional Tailings Pond; 1.6.8 Example of Stress and Shear Strength Applications; 1.6.9 Example of Combined Stress, Seepage, and Deformation Analysis; 1.7 Engineering Protocols for Unsaturated Soils; 1.7.1 Definition of Engineering Protocol; 1.7.2 Categorization of Engineering Design Protocols; 1.7.3 Preliminary Design Protocols; 1.7.4 Final Design Protocols; 1.7.5 Verification or Monitoring Category
1.7.6 Other Factors Affecting Engineering Design Protocol
1.7.7 Challenge for the Future; Chapter 2 Nature and Phase Properties of Unsaturated Soil; 2.1 Introduction; 2.1.1 What Is an Unsaturated Soil?; 2.1.2 Unsaturated Soil as Four-Phase Mixture; 2.1.3 Distinctive Features of Contractile Skin; 2.1.4 Terminology for Continuum Mechanics Variables of State; 2.1.5 Designation of Stress State Variables; 2.1.6 Designation of Deformation State Variables; 2.1.7 Typical Profiles of Unsaturated Soils; 2.2 Soil Classification; 2.2.1 Grain-Size Distribution Curves
2.2.2 Equation for Grain-Size Distribution Curve

Sommario/riassunto

"Here is the definitive guide to unsaturated soil by the world's expert in the area of unsaturated soil mechanics. This volume features the latest information and replaces the leading text in the field, also written by this author team. The text offers state-of-the-art information to deal with the practical engineering problems resulting from unsaturated soil. Greater emphasis has been placed on the using the soil-water characteristic curve in solving practical engineering problems, as well as the quantification of thermal and moisture boundary conditions based on weather data"--
