

Book review

Geotechnical Slope Analysis, 2nd edn

by Robin Chowdhury, Phil Flentje and Gautam Bhattacharya, CRC Press, Boca Raton, FL, USA, 2010, ISBN 978-0-415-46974-6, **£109.00, 728 pp.**

The second edition of this popular textbook is an updated version of the original *Slope Analysis* by Chowdhury, published by Elsevier in 1978. It aims to meet the requirements of both the undergraduate and the researcher, while forming the basis of reference material for the practitioner.

The book is arranged in 12 chapters, with appendices included as supporting text to individual topic areas. Chapter 1 sets out the aim of the book, which is to provide an overview of recent developments, perspectives and trends in the field of slope stability analysis. Particular issues covered include recent developments in slope assessment and analysis, developments associated with the acquisition and processing of monitoring data, and the impact of climate change. This chapter then goes on to discuss the general aims and geotechnical processes associated with slope analysis. Chapter 2 guides the reader through an introduction to the basic geotechnical concepts as they relate to slope stability issues. These first two chapters provide a good introduction to the principles of geology, materials and slopes; they are well presented, and easy both to read and to understand.

Chapter 3 looks at issues associated with performance indicators and basic probability concepts, and Chapters 4 and 5 address limit equilibrium methods based on planar and general failure surfaces. These chapters provide a good overview of the available methods of analysis, and set out the limitations of these methods as they relate to different materials and stress conditions. The chapters look at the two-dimensional approach to analysis, while emphasising the need to consider the potential three-dimensional effects. Some case studies, rather limited in number, and a very brief discussion on ways to improve slope stability are also provided.

Chapters 6 and 7 deal with stress deformation analysis and initial stress distributions respectively. These chapters delve into the use of finite-element methods for slope stability analysis, and discuss the important topic of appropriate material parameter selection. The subject of back-analysis of failed natural slopes is also discussed. The chapters include

some useful tables and graphs for input data selection to assist and guide the reader during practical application.

Chapter 8 provides a brief review on plasticity and shear band analyses. This section of the book has a more conceptual appeal, with continuing research efforts to extend the range of application of these techniques. In reality, their practical application is limited by restrictions on geometrical and loading conditions, material behaviour and the assumption of homogeneity of the soil or rock. So while it is interesting to learn about these new techniques, they are likely to be of limited appeal to the practitioner at the moment.

Chapter 9 reviews earthquake effects and seismic slope stability analysis. It provides a good basic summary of the subject, and includes a discussion on the subject of current practice. This section of the book covers the phenomenon and potential impact of liquefaction and seismic displacement, and attempts to demonstrate the validity, or otherwise, of the design methods discussed by undertaking back-analysis of the lower San Fernando dam. Chapter 10 develops the discussion on the probabilistic approach and reliability analysis for slope failures to address the uncertainties involved in geotechnical slope stability analysis, and the associated risks. The remaining chapters review various case studies based on urban slope stability, and include a summing up of the key issues explored by the book.

The examples and the photograph included within the book are drawn mainly from the southern hemisphere. This is understandable, given the locations of the authors (Chowdhury and Flentje are based in Australia; Bhattacharya in India), but unfamiliar to those of us who live and work in the northern hemisphere.

The authors dedicate the book to 'those progressive readers who gently asked about a second edition ... and also to earnest new readers'. This book will not disappoint those readers; we commend it as a useful textbook for all those interested in or working with or on slopes.

Pam Rigby and David Jones