

Book review

RISK ASSESSMENT IN GEOTECHNICAL ENGINEERING

G. A Fenton and D. V. Griffiths. Wiley, Chichester, 2008. ISBN 978-0-470-17820-1, 480 pp., £100

While, historically, risk analysis has been used in geotechnical engineering for developing magnitudes of wave or seismic loads, in recent years there has been a growth in interest in applying statistical methods to more mainstream areas of geotechnical engineering. The growth in interest has therefore resulted in several books being published recently that consider this subject. Other texts exist, such as Baecher and Christian,¹ covering traditional areas of geotechnical engineering, but this new book includes recent developments such as the application of random field simulation techniques and the random finite-element method. The target audience for this book includes both students and practising engineers wishing to develop their understanding of the theory and methodologies behind risk assessment in geotechnical engineering.

The book is split into three parts. The first part comprises seven chapters addressing the theory relating to statistical analysis. For most readers this part of the book will serve as an excellent reference tool for statistical theory. The part also includes over 100 example calculations with a geotechnical bias demonstrating the theory. The examples help to clarify some of the more complex mathematical formulations detailed in the text.

The second part of the book describes the application of some of the theory contained in the first seven chapters to addressing classical geotechnical problems. There are chapters that concentrate on groundwater modelling, flow through dams, bearing capacity and settlement of shallow foundations, deep foundations, slope stability, earth pressures, mine pillar capacity and liquefaction. These chapters will be of particular interest to practising engineers in understanding how statistical methods could be applied to geotechnical analysis. It is interesting to contrast the discussion in the text relating to the variability of load and resistance factors (for instance in the shallow foundation section) with the methods considered in the Eurocode publication EN 1990.²

The third section of the book includes probability tables used in numerous problems contained in the first two parts.

In summary, the book provides a comprehensive reference for engineers, students and academics who are keen to develop their analytical skills in the application of statistical methods to geotechnical analysis.

REFERENCES

1. BAECHER G. B. and CHRISTIAN J. T. *Reliability and Statistics in Geotechnical Engineering*. Wiley, Chichester, 2003.
2. BRITISH STANDARDS INSTITUTION. *Eurocode: Basis of Structural Design*. BSI, Milton Keynes, 2002, BS EN 1990.

M. DEVRIENDT