

Book review

Geotechnical Engineering, 2nd edn

Renato Lancellotta, Taylor & Francis, Abingdon, UK, 2009, ISBN 978-0-415-42004-4, **£36.99, 520 pp.**

As the author states in his preface, this second edition of Lancellotta's popular textbook has been designed to be both a classroom teaching book for undergraduate students and a source of information for individuals involved in geotechnical research or studying for specialist postgraduate degrees.

The book is structured in four parts. The first part aims to give the reader sufficient background material on soil characteristics, continuum mechanics and basic constitutive models. The next three chapters constitute the second part of the book, and deal with the backbone of the subject of soil mechanics: the theory of effective stress; consolidation; stress-strain behaviour, including critical-state soil mechanics; and finally seepage. Ground investigation techniques are discussed in the third part of the book (Chapter 7), and the last part of the book covers the application of limit-state theories to geotechnical engineering design.

Chapter 1 opens in a manner that hints at the translation problems that are found throughout the book ('The beginning reader will quickly realize ...'). This chapter introduces soils as engineering materials but it never really gives the (student) reader a good idea of how soils behave or what sets them apart from other engineering materials. Chapters 2 and 3 (continuum mechanics and basic constitutive models) are almost entirely theoretical. Although both subjects play an important role in applying the principles of engineering mechanics to soils, their prominence within the book could well discourage students from reading beyond the opening chapters, rather than enthusing them to delve further into the subject. Indeed, these opening chapters tend to suggest that the theories of

engineering mechanics are more important than real soil behaviour (rather than vice versa).

In contrast to Chapters 1, 2 and 3, which constitute an over-complicated introduction to the subject of geotechnical engineering, Chapters 4, 5 and 6 are well presented and well written. Overall, this section of the book benefits from a thoughtful intermixing of theory and practice, which is delivered through interesting examples and case histories.

Chapter 7 of the book deals with site investigations. It provides a useful and reasonably comprehensive summary of intrusive and non-intrusive techniques for modern ground investigations. However, the desk study process is not explained in great detail and the inclusion of more field and laboratory data from real ground investigations would have helped to explain the difficulties of interpretation to new students and fresh graduates.

The last two chapters in the book reflect the changes to the geotechnical design process brought about by Eurocode implementation. These chapters relate, respectively, to the collapse of soil structures (the ultimate limit state) and to the serviceability limit state. Eurocode terminology is not used explicitly, but most readers will be able to easily relate the theory and the examples provided to familiar design situations. Case histories and relevant theories are presented in a useful and informative way.

Overall, this second edition of *Geotechnical Engineering* contains much that is useful to both students and young practising engineers alike.

Philip Smith