Book reviews

THE ESSENCE OF GEOTECHNICAL ENGINEERING: 60 YEARS OF GÉOTECHNIQUE

Honorary Editor J. Atkinson. Thomas Telford, 2008. ISBN 9780727735362, £50, 400 pp.

The Essence of Geotechnical Engineering commemorates the diamond jubilee of the journal *Géotechnique*. Following an introduction from the honorary editor, John Atkinson, the book is split into three parts: *Géotechnique*, past, present and future; Contributions to *Géotechnique* 1948–2008; and Seminal papers and discussion 1950–1990.

The first section provides three papers charting the history of the journal, its founders, and geotechnical publications prior to *Géotechnique*. For those not familiar with the history and development of geotechnical engineering, these papers provide an excellent historical account. The paper by Burland, in particular, provides an interesting insight into the characters and personalities of the journal's founders. The Chrimes paper charts the development of the profession. It is interesting to compare this paper with an account of the geotechnical challenges faced by engineers in the early 20th century described by Burland.¹ The fourth paper, by Simpson and Tatsuoka, speculates on what developments will take place in geotechnical engineering (and in *Géotechnique*) over the forthcoming 60 years. This paper is thought-provoking, and presents a perspective on future trends and an insight into where research opportunities may lie in the future.

The second section provides 13 papers covering different areas of geotechnical engineering and related disciplines. The papers provide a historical account of the contributions that *Géotechnique* papers have made to the development of theory and practice in each discipline considered. Many of the papers have adhered to the title of identifying papers published solely in *Géotechnique*. Other papers, for example those covering retaining walls, ground improvement, groundwater, engineering geology rock mechanics and rock engineering, are more wide-ranging in their citation. These papers, in particular, provide a context for the role that *Géotechnique* has played in the development of these areas of ground engineering related disciplines.

The final section of the book includes nine seminal papers published in *Géotechnique* during the period 1950–1990.

Rankine Lecture papers were excluded from selection on the basis that they are rarely seminal, and those up to 1990 have been published separately as collections. The inclusion of only nine papers must have presented a difficult selection challenge for the review panel. It is of note that five of the papers derive from the 1950s, identifying the significant contribution that *Géotechnique* played during this era. The discussion relating to these papers, particularly Roscoe *et al.* 'On the yielding of clays', is illuminating, and serves as a reminder of the importance that discussion articles should play in journals.

REFERENCE

1. BURLAND J. B. Personal reflections on the teaching of soil mechanics. *Proceedings of the 1st Conference on Education and Training in Geo-engineering Sciences, Constanza*, 2008.

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ADVANCED SOIL MECHANICS

B. M. Das. Taylor & Francis, Abingdon, 2008. ISBN 978-0-415-42026-6 (hardback), £49.99, 567 pp.

Now recently released in its third edition, *Advanced Soil Mechanics* by Braja M. Das has had some small additions to most of its chapters since the second edition. The book is aimed at MSc students and geotechnical practitioners looking for something more than a basic soils text. Once past the elastic theory development that is given in full near the beginning, the book engages well with practical problem-solving. It provides extensive worked examples, which are helpful for many of the solutions presented, involving reference to tables of coefficients and influence factor charts.

There is a thorough physico-chemical description of clay particles as well as soil-phase relationships and soil classification at the beginning. A variety of practical elastic problems and solution methods are then developed, after a thorough description of elastic equations for equilibrium and compatibility. The solutions refer largely to surface ground-loading problems. There is no description of elastic (Lame's equations) or, later on, perhaps elasto-plastic cavity expansion theory, which would have been useful for pile- or shaft-type problems.

One of the main strengths of the book, as with the previous editions, lies in the following few chapters, which address

seepage and consolidation. These subjects are developed clearly and thoroughly, and include references to both theoretical and empirical permeability assessments for soils; consolidation solutions for gradually applied loads; secondary consolidation and creep; and a thorough section on sand-drains. The new edition also includes material on electro-osmosis in clay soils, and a visco-elastic consolidation model.

Shear strength, both drained and undrained, is then examined, and there are useful additions beyond the descriptions of yield criteria that include the effects of strain rate, temperature, creep and thixotropic strength development in soft clays. Residual strength and strength anisotropy in particular might be better addressed. Although the chapter is titled 'Shear strength', there is no heading in the book for stiffness. So there is something of a gap in covering fully non-linear elastic stiffness, and how this might alter with strain and stress level,

soil types, stress history and path, and changes in path direction, for example. The book ends with a practical chapter illustrating solutions on the settlement of shallow foundations under vertical load.

Advanced Soil Mechanics is not comprehensive on soil theory. For example, there is nothing given on either soil compaction or retaining wall analysis. Also, some of the observations made here are doubtless a consequence of the book having been originally written 25 years ago. In spite of this, the layout, figures and overall production are clear, and with the material still relevant, and at less than £50·00, it offers value compared with other advanced soils textbooks. It could certainly usefully occupy a space on the shelves of a practising engineer.

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