

Book review

Fundamentals of Ground Engineering

J. Atkinson. CRC Press, Boca Raton, FL, USA, 2014, ISBN 978-1-4822-0617-3, £18.99, 242 pp.

In *Fundamentals of Ground Engineering*, Professor John Atkinson takes readers on a journey of discovery – or rediscovery – of what geotechnical engineering is about. Although this is indeed another book covering common aspects of ground engineering, the approach used by Atkinson contrasts very noticeably from that adopted in the vast majority of other similarly themed works. In effect, Atkinson has elected to present the basics of current geotechnical knowledge in a visually attractive form, with easily digested short paragraphs grouped in tables, themselves collected in themed chapters and parts covering the various aspects of geotechnical engineering. This approach is supported by numerous simple yet effective diagrams and illustrative photographs, effortlessly pulling the reader in.

As with other similarly themed books, this publication starts with some geological concepts and progressively moves into soil mechanics considerations, before covering common geotechnical engineering problems. A definition of geotechnical engineering is first presented by way of introduction, and Part A then moves on to describe what ground is and what it is made of, how it is formed and structured, and how its nature and properties are usually investigated. Part B then introduces essential concepts of physics and mechanics, including strength and stiffness, stress and strain, elasticity and plasticity, water and water

pressure, saturation, seepage and permeability. Part C covers soil mechanics and describes, in a straightforward manner, commonly encountered aspects of soil mechanics – pore pressure and effective and total stress, drained and undrained loading, soil behaviour, soil deformation and generic models, consolidation and creep, soil strength, state and state parameters, numerical modelling and Cam Clay, and design soil parameters. The final part, Part D, then deals with conventional geotechnical engineering problems such as routine analyses of geotechnical structures (foundations, settlement and seepage), slope stability, foundations (shallow and piled), retaining walls (earth pressure, gravity and embedded retaining walls), unsaturated and difficult soils (including ground improvement), before finishing with a short consideration of the principles of geotechnical design.

Those relatively new to ground engineering will find this book a useful and easily tapped into source of background information on the subject, to help form the basis of their knowledge and experience. As geotechnical engineering has become increasingly more complex, more seasoned ground engineering practitioners will find this a refreshing book, in appearance simple but going to the heart of the various elements of geotechnical engineering. Colleagues in construction-related occupations will also find this a useful tool to gain an initial appreciation of many of the geotechnical engineering aspects of construction projects. In short, *Fundamentals of Ground Engineering* is an interesting addition to almost any construction professional's technical library.

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