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Foreword and endorsement

The civil engineering sector represents some of the best professionalism, foresight and talent of any profession and this hard won reputation has been built up over decades. This ICE Manual series helps the profession maintain this position through the provision of coherent and authoritative frameworks for the modern civil engineer.

The importance of geotechnical engineering cannot be underestimated. It has a critical role to play in almost all major infrastructure projects being carried out across the world today.

The challenges are significant to deliver projects with the lowest carbon output and value for money. Promoting and developing our understanding of the impact of earth materials on engineering schemes will be crucial if we are to deliver safe, sustainable and economic answers to these challenges.

In bringing together often fragmented sources in a single document for civil engineers ICE Publishing is providing an excellent service for the professional and their projects in the interest of society. I commend the publication of this work and look forward to future editions.

Richard Coackley BSc CEng FICE CWEM FCIWEM
ICE President 2011-2012

It is several centuries since the *Magistri Ludi* were respected for understanding known science. It is several decades since individuals could be compared to the *Magistri* in the broad field of geotechnical engineering. So the *ICE Manual of Geotechnical Engineering*, as conceived here, has a dual function: to aid the specialist practitioners in areas where they are less experienced and to guide the non-specialists in their approach to problems. It fulfils this role commendably.

Rab Fernie Eur Ing BSc CEng FICE FIHT FGS
Chairman, British Geotechnical Association

Preface

We began to formulate the initial ideas for this Manual as early as 2006. It had become apparent to us that civil and structural engineers not specialising in geotechnics face a daunting knowledge gap when they come up against a geotechnical problem. Most civil engineers leave university with very little grounding in geotechnical engineering. They will have a fair grasp of applied mechanics (mainly aimed at structural engineering). They will have had a basic introduction to geology and they will have studied the elements of soil mechanics and rock mechanics. But a recent graduate usually lacks a coherent understanding of the approach to, and methods of, geotechnical engineering and how these differ from other more widely practised branches of engineering. A survey carried out by ICE Publishing showed that information tends to be obtained from a wide range of sources through word of mouth, the internet and various publications. For the young practitioner this leads to a fragmented approach. Much of the geotechnical material is written by specialists for specialists and its *ad hoc* application by a general practitioner is often inappropriate and can be extremely dangerous. We felt that it would be of great benefit to our profession to provide a single first-port-of-call authoritative reference source aimed at informing the less experienced engineer. To our delight this concept was endorsed by the ICE Best Practice Panel and the British Geotechnical Association and has offered a unique opportunity to provide authoritative guidance within a coherent framework of good geotechnical engineering.

This *ICE Manual of Geotechnical Engineering* has been a labour of love! The contribution of 99 contributors and 10 section editors has made it possible to distil a great deal of experience from the profession into the books you see here. Don't imagine this will cover everything that a geotechnical engineer will face in their career – but it provides a “starting point” from which to build experience whilst remaining grounded in robust fundamentals.

As mentioned previously, the Manual is aimed at people in the early stage of their careers who need a readily accessible source of information when working in new aspects of geotechnical engineering. However it is expected that it also should prove valuable to all geotechnical engineering professionals. The aim has been to produce a manual that addresses the practice of geotechnical engineering in the 21st century including contemporary procurement, process and design standards and procedures. The grouping of chapters has been carefully chosen to facilitate a multi-disciplinary and holistic approach to the solution of construction challenges. A key message is the importance of drawing on “well-winnowed experience” for the smooth and reliable execution of projects. Such experience is best gained by working closely with a suitably experienced design or construction team.

It is hoped that this Manual will help in the training and development of the next generation of geotechnical engineers and will act as a useful source of reference to those with more experience.

The Editors are grateful to all those contributors and section editors who have generously given so much of their time and knowledge in producing such a comprehensive book.

John Burland, Tim Chapman, Hilary Skinner and Michael Brown

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