

Book review

The Deep Mixing Method

Masuki Kitazume and Masaaki Terashi, CRC Press, 2013,
ISBN 978-1-13-800005-6, £89.00, 410 pp.

The Deep Mixing Method is a compilation of Japanese experience in stabilised material behaviour, engineering properties, applications, construction, design considerations and methods. The stated aim of the book is to provide a state-of-the-art/practice review for deep mixing.

The book starts with a discussion on factors affecting strength and engineering properties of stabilised soils. Much valuable laboratory and field test data are presented in simple graphical form. Of particular interest is a section on the performance of stabilised soil over a 20 year period, as few case histories demonstrating long-term performance exist in the technical literature. Some data are also presented showing the performance of stabilised contaminated ground, albeit over short timeframes.

Applications of the deep mixing method are discussed in chapter 4. This section is particularly useful for inexperienced designers. There are some useful case histories demonstrating the good performance of stabilised soil during earthquakes.

Construction of stabilised soil by way of various deep mixing methods is discussed in chapter 5. Various types of equipment used in Japan are summarised along with methods of construction. Useful data on noise and vibration as well as lateral soil movements and heave are presented.

A very substantial section on design of stabilised soil can be found in

chapter 6. A detailed discussion of failure modes that need to be considered is followed by presentation of extensive analytical equations for design under various circumstances.

Requirements for quality assurance and control are discussed in chapter 7. This topic is important but the text is repetitive as the quality assurance/quality control (QA/QC) procedures for various methods are broadly similar.

Stabilised soil can have highly variable strengths and stiffnesses. Although this is noted in the book, statistical or probabilistic approaches are not discussed. Variability appears to be controlled by adopting large factors of safety in design and by adopting rigorous QA/QC procedures during construction. It appears that the Japanese method typically adopts higher densities of columns and higher column strengths than are used in Europe. However, the general principles provided in the book are universally applicable.

This book is a valuable compilation of data and experience for practising engineers and contractors from sources that are not readily available in the technical literature. Academics will obtain a feel for real-world problems along with some areas that require further research. The translation from Japanese to English is stilted and repetitive in places, but the text is easy to read. Overall, the book broadly succeeds in its aim and is a useful resource in the field of ground improvement by deep soil mixing.

Richard Kelly