Geosynthetics International, 2017, **24**, No. 1
[http://dx.doi.org/10.1680/jgein.2017.24.1.113]

Book review

Design guideline basal reinforced piled embankments. S.J.M. van Eekelen and M.H.A. Brugman (eds), SBRCURnet, The Netherlands and CRC Press, FL, USA, 2016, ISBN 978-9-0536-7624-0, £69.99, 160 pp.

The first geosynthetic-reinforced, pile-supported embankment was constructed in the 1970s in Sweden. Ten years later, the UK followed and since then basal reinforced piled embankments have become an accepted solution to improve the construction and performance of embankments on soft soil. A chapter on design of piled embankments first appeared in the British Standard BS8006 in 1995 (now 2010). Fifteen years later, the Germans also dedicated a chapter on piled embankments in their national design guideline, EBGEO (Deutsche Gesellschaft für Geotechnik e.V., 2010). Many papers on case studies, analysis and design of basal reinforced piled embankments can be found in the peer-reviewed journal literature. In *Geosynthetics International* alone there are more than 25 papers that fall within this topic. A major contributor to the advancement of our understanding of this technology and the developement of practical tools for analysis and design is Dr Suzanne J.M. van Eekelen (e.g., van Eekelen, 2015) and her colleagues. Dr van Eekelen led a committee that developed the Dutch design guideline for basal reinforced piled embankments published as CUR226 (CUR Bouw and Infra, 2010). The book reviewed here is based on the English version of an update of this Dutch standard. The core of the design method in this book is the new 'concentric arches' model for the design of the geosynthetic reinforcement used in pile-supported embankments. The approach is analytical using closed-form equations that also appear as simple design charts. The development of this model is based on a series of journal papers by Dr van Eekelen and her co-workers. They based the new concentric arches model on the results of a series of three-dimensional model experiments that extended and improved upon earlier models proposed by others. The accuracy of the general approach to predict geosynthetic reinforcement tensile strains has been verified against measurements taken from field studies and experiments conducted by researchers in different countries. The design guidelines in this book are comprehensive and present a step-by-step approach to the design of these systems that is in conformity with the European Eurocode. Three sets of partial factors are proposed that satisfy minimum reliability indices for the three reliability classes recommended in EC1990 (2011; Eurocode 0). The book covers the following topics

- requirements for reinforced embankments
- requirements for the piles and pile caps and recommendations for pile and pile cap design
- design of the reinforced embankment including selection of the geosynthetic reinforcement based on stiffness, strength and service life
- treatment of traffic loads
- evaluation of pile moments
- transition zones
- construction details and advice for the management and maintenance of piled embankments.

An important feature of the book are extensive calculation examples. The book also includes guidance on numerical modelling of these systems for more complex scenarios. This is a lovely book full of high-quality pictures, comprehensive calculation examples and many practical tips. The book represents the state-of-the-art for geosynthetic-reinforced pile-supported embankment design that is founded on extensive Dutch research. It is a must-have for both practitioners and researchers.

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