

RESEARCH DIRECTIONS

Good Foundations

Dr Samantha Liyanapathirana from the School of Engineering, along with Professor Harry Poulos and Dr Richard Kelly of Coffey Geotechnics is developing and testing new, safer and more stable designs for the engineering of embankments built on soft ground. This research is funded by Coffey Geotechnics and the Australian Research Council through its Linkage Project grants scheme.

'Embankments are made of earth, concrete and synthetic materials and are built to provide an elevated platform for such structures as roads, railways and runways,' explains Dr Liyanapathirana. 'With increased infrastructure development, more embankments are being built on soft ground such as riverside, coastal and marshland areas that would have previously been considered unsuitable. Concrete piles can be used to support embankments but Deep Cement Mixed columns embedded deep in the soil maybe an efficient and low-cost alternative. However, little is known about how stable and safe these are on a soft soil which may settle and move over time and which has low load-bearing capacity. This project will develop new models that can confidently predict how the embankment will bear a load and what movement may occur due to soil settlement. New embankment design guidelines will be developed using the results of these model predictions.'

New computer models will be developed, considering factors such as the tension and creep effects of the geosynthetic, lateral deformations and cement degradation that have not been included in previous models which will predict the movement of the embankment in different directions and the stability of these structures. Design guidelines and new analysis methods will be developed and validated using test data and case histories of embankment performance in different countries.



Major infrastructure damage can have very serious social, economic and even political impacts, with injury or loss of life - possibly resulting from a catastrophic structural failure. This project will enhance Australia's international competitiveness and export potential of its construction industry, particularly to south-east Asia where many development sites lie on soft clay. The new design guidelines developed for this project will be relevant across construction industries worldwide.

Project Title: New design guidelines and simplified analysis methods for geosynthetic reinforced pile-supported embankments.

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