Faculty of Engineering  
Summer Research Program 2021-2022

Project Title: Characterisation of Resilient Modulus and Rutting Behavior of Unbound Granular Materials for Pavement Design.

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Objective

The main aim of this project is to characterize the resilient modulus and rutting behavior of unbound granular materials for different moisture contents and densities using the cutting-edge and innovative device Precision Unbound Material Analyser (PUMA).

Project Details

Over 90% of the Australian road network consists of unbound granular pavements with thin seal. Unbound granular pavements with thin seal are generally designed using a simple empirical chart (Figure 8.4, Austroads 2017) for overall rutting of the pavement structure, which was developed in the 1930s based on some field experiments conducted on Unbound Granular Materials (UGMs). This method do not take into account the modulus of the UGMs and the rutting behaviour of the unbound granular pavements separately. The main aim of this project is characterize the resilient modulus and rutting behavior of unbound granular materials for different moisture contents and densities using the cutting-edge and innovative device Precision Unbound Material Analyser (PUMA). The results of this study will be compared with the California Bearing Ratio (CBR) of the same material under different densities and moisture contents (obtained from another project) and a new design chart for UGMs incorporating the modulus of UGMs will be developed for pavement design.

SPARC Hub undertakes research activities in collaboration with leading industry in road pavements and it provides unique opportunities for students to engage with practitioners from the industry. Further information about SPARC Hub can be found in https://sparchub.org.au

Prerequisites

Enrolled in Civil Engineering Degree.
CIV 2242
CIV 3247 & CIV 3283 (optional)

Additional Information

The successful candidate will be required to undertake laboratory induction and relevant risk assessment before commencing any laboratory experiments.