

## Cleaning effect on clogged porous asphalt mixture

*Cui Ming Ng<sup>a</sup>; Siaw Ing Nicole Liew<sup>a</sup>; Ramadhansyah Putra Jaya<sup>a</sup>; Khairil Azman Masri<sup>a</sup>; Zul Fahmi Mohamed Jaafar<sup>b</sup>; Abdullahi Ali Mohamed<sup>c</sup>; Muhammad Naqiuddin Mohd Warid<sup>d</sup>; Norhidayah Abdul Hassan<sup>d</sup>*

<sup>a</sup> Department of Civil Engineering, College of Engineering, Universiti Malaysia Pahang, Kuantan, Gambang, 26300, Malaysia

<sup>b</sup> School of Civil Engineering, Universiti Sains Malaysia (Engineering Campus), Penang, Nibong Tebal, 14300, Malaysia

<sup>c</sup> Department of Civil Engineering, Faculty of Engineering, University of Nottingham Malaysia, Selangor, Semenyih, 43500, Malaysia

<sup>d</sup> Faculty of Engineering, School of Civil Engineering, Universiti Teknologi Malaysia, Skudai, Johor Bahru, 81310, Malaysia

### ABSTRACT

Porous asphalt pavements provide developers and planners with a new tool for stormwater management and noise reduction. However, the clogging of pores caused by sediment could significantly affect the permeability of porous asphalt. Thus, the objectives of this study are to determine the effect on the permeability of the clogged porous asphalt mixture, investigate the cleaning effect on the performance of porous asphalt mixture, and study the Image processing of clogged in the porous asphalt mixture. To assess the effect of clogging on permeability, Marshall Stability test and Binder Drawn test were performed. In addition, Image J software analysis was applied to show the sediment's particle size and the void of the mixture. From the Marshall Stability test, the amount of void mixture can be concluded that the void decreases with increasing clay content. From the Binder Drawn test, the retained binder increased as the percentage of bitumen increased. This indicates that the permeability of the mixture is lower in the presence of a blocking agent. The analytical of image study found that the images can be seen more clearly and can distinguish each mixture of materials used. In addition, the total percentage of voids can be identified from the analyzed images.

### KEYWORDS

Pavement; Clogged; Stormwater management

**ACKNOWLEDGEMENTS**

The support provided by the Malaysian Ministry of Higher Education and Universiti Malaysia Pahang in the form of a research grant vote number PGRS2003172 for this study is highly appreciated.