

Permeability coefficient of porous asphalt mixture containing coconut shells and fibres

A. H. Norhidayah^a, Y. Haryati^a, M. Nordiana^a, M. S. Mohd Khairul Idham^a, A. Juraidah^b and P. J. Ramadhansyah^c

^aFaculty of Engineering, School of Civil Engineering, Universiti Teknologi Malaysia, 81310 Skudai, Johor Bahru, Malaysia

^bFaculty of Civil Engineering, Universiti Teknologi MARA, 40450 Shah Alam, Selangor, Malaysia

^cFaculty of Civil Engineering and Earth Resources, Universiti Malaysia Pahang, 26300 Gambang, Pahang, Malaysia

Corresponding author: ramadhansyah@ump.edu.my

ABSTRACT

The abundance of coconut shells (CS) have been involved in environmental issues. Yet new sources of aggregates should be found from environmental waste. CS and coconut fibres (CF) have been chosen from environmental waste to use in this study. Generally, this research concerns the partial replacement of coconut shells in coarse aggregates and coconut fibres as additives in porous asphalt mixture. CS and CF were put through chemical treatment by soaking in 5wt% of Sodium Hydroxide (NaOH) solution before being involved in the mixture. CS has been used to substitute 5mm of coarse aggregate with 0%, 5%, 10% and 15% while CF were added into porous asphalt mixtures with 0%, 0.3% and 0.5%. Permeability and air voids test were carried out to analyse the durability characteristics of porous asphalt mix. The results show that coconut shells and fibres can reduce the drainage time since coconut fibres in the samples could reduce clogging by binders. On the other hand, 15% of treated CS has a lower air void than untreated CS.

KEYWORDS :

Sodium Hydroxide (NaOH); coconut shells